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ABSTRACT

The papers comprising this volume discuss research based on an ecobehavioral interaction approach to special education. Six papers are included, which range from a highly conceptual discussion of second language instruction/learning to research concerning interventions to reviews of the research literature. The papers have the following titles and authors: "Ecobehavioral Analysis of the Relationship of Teaching Formats, Academic Responding, and Competing Responses with Autistic Students: A Case Study" (David Rotholz); "An Ecobehavioral Look at Disruptive Classroom Behavior and Academic Achievement" (Barbara Terry); "Second Language Instruction and Learning: Ecobehavioral Implications" (Dennis Madrid); "Ecobehavioral Variables Affecting Severely Handicapped Children in Institutions and Community Settings: A Comparative Analysis" (Gwendolyn Benson-Scott); "Micro-Ethnographic and Ecobehavioral Research Methods: Implications for Bilingual Education" (Gene Chavez); "The Effect of Point Withdrawal on Academic Response Rates in the Juniper Gardens Peer Tutoring Game" (Christopher Nelson). (JDD)

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An Eco-Behavioral Approach To Research In Special Education

The Juniper Gardens Children's Project

The University of Kansas
Bureau of Child Research and Departments of
Special Education and Human Development and Family Life

EC 200768

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AN ECOBEHAVIORAL APPROACH TO RESEARCH IN SPECIAL EDUCATION

A product of the Juniper Gardens Children's Project, Bureau of Child Research and Departments of Special Education and Human Development and Family Life

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CONTENTS

		Page
Contributors		iv
Preface		v
Acknowledgements		vi
Chapter I:	Introduction (Carmen Arreaga-Mayer)	1
Chapter II:	Ecobehavioral Analysis of the Relationship of Teaching Formats, Academic Responding, and Competing Responses with Autistic Students: A Case Study (David A. Rotholz)	4
Chapter III:	An Ecobehavioral Look at Disruptive Classroom Behavior and Academic Achievement (Barbara Jean Terry)	18
Chapter IV:	Second Language Instruction and Learning: Ecobehavioral Implications (Dennis L. Madrid)	41
Chapter V:	Ecobehavioral Variables Affecting Severely Handicapped Children in Institutions and Community Settings: A Comparative Analysis (Gwendolyn Benson-Scott)	57
Chapter VI:	Micro-Ethnographic and Ecobehavioral Research Methods: Implications for Bilingual Education (Gene Chavez)	89
Chapter VII:	The Effect of Point Withdrawal on Academic Response Rates in the Juniper Gardens Peer Tutoring Game (Christopher F. Nelson)	102
Chapter VIII:	Concluding Remarks (Carmen Arreaga-Mayer, Charles R. Greenwood, & Judith J. Carta)	119

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PREFACE

From 1983 to 1986 the Special Education Program of the U.S. Department of Education supported a post-doctoral fellowship program in research at the Juniper Gardens Children's Project. The Children's Project has been a 22 year program in research and development concerning the problems of low-income and minority group children and their families. Within the last nine years, research based upon an ecobehavioral interaction approach has evolved. Part of each post-doctoral fellow's requirements during their fellowship year was the development of a review paper and/or empirical research project in which each fellow examined an area of their interest from the perspective of an ecobehavioral approach. The results of these individual scholarly efforts are contained in Volumes 1 (1985) and 2 (1987) of this Monograph Series. In this second volume the chapters span a range from the highly conceptual (i.e., the chapter by Madrid), to research concerning interventions (i.e., the chapters by Rotholz and Nelson, to reviews of the research literature (i.e., the chapters by Benson, Chavez, and Terry).

The major underlying theme to these works is an ecobehavioral interaction view of the educational process. An effort is made in the introduction to define ecobehavioral interaction research. However, since this research, as a content area and as a methodology is rapidly developing, the adequacy of this definition must be considered in light of continuing developments.

This monograph is intended for researchers in ecological psychology, special education, and applied behavior analysis who are interested in expanding their methodology to include the quantitative assessment of ecological and behavioral factors in their work. The benefits, significance, and dimensions of this approach will be revealed in this monograph.

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CHAPTER I

INTRODUCTION

CARMEN ARREAGA-MAYER

Ecobehavioral analysis is an area of applied behavioral analysis resulting from the incorporation of behavior analysis with ecological psychology. The notion of ecobehavioral analysis originated from Willems' (1974) classic article entitled "Behavioral technology and behavioral ecology" and Baer's (1974) rejoinder to Willems. These researchers presented behaviorists with the challenge to examine the relationship between behavior and the ecologies in which the behavioral interventions occurred for the purpose of enhancing behavioral intervention strategies. Although natural science approaches to behavioral analysis have been based upon theoretical conceptualizations of ecobehavioral interactions for years (Barker, 1961; Kantor, 1954; Skinner, 1953), empirical data in this area has been forthcoming only in the last 11 years. Greenwood (1985) stated that in applied research particularly, this has been the result of technology advances, particularly in computer-assisted observation systems. He further asserted that these systems have enabled researchers to gather and analyze complex information on the structure, sequence, and function of eco-behavioral phenomena.

Ecobehavioral research implies assessment and intervention designed to reveal sequential and concurrent interrelationships between environmental stimuli and organism response. A goal of eco-behavioral analysis is to assess both the social and the physical stimuli temporally associated with subject behavior. At the Juniper Gardens Children's Project we have used the term "ecobehavioral" in our work in classrooms to refer to the measurement of a constellation of stimuli events broader than subject to subject interaction (i.e., physical arrangements, the curriculum, and teacher stimulus events {Greenwood, 1985}). Our main research interest has been in determining the moment-to-moment instructional variables that effect student's academic performance in the classroom. In our work we have included the subject matter, instructional materials, physical grouping, teacher location, and teacher behavior, which are the general and specific contexts for student's classroom and academic behaviors.

The applicability of an ecobehavioral interaction approach lies in its potential as a tool for exploring the effects of natural stimuli in the natural environment (Greenwood, 1985). The use of ecobehavioral assessment strategies provides the possibility to develop precision interventions that will be effective both in the initial stages of treatment and in the generalization and maintenance of behavior change. As with other approaches to assessment in the field of applied behavior analysis, the importance of the eco-behavioral approach will be its contribution to our ability to predict, control and maintain behaviors.

This monograph volume further explores and defines the characteristics of an ecobehavioral approach to assessment for both theoretical and practical purposes. By describing and defining a wider range of behavior-environment relationships and observational systems, this monograph provides a forum for further research directions in the development of ecobehavioral analysis

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CHAPTER II

ECOBEHAVIORAL ANALYSIS OF THE RELATIONSHIP OF TEACHING FORMATS, ACADEMIC RESPONDING, AND COMPETING RESPONSES WITH AUTISTIC STUDENTS: A CASE STUDY

DAVID A. ROTHOLZ

Abstract

Ecobehavioral analysis has recently emerged as a sophisticated and appropriate methodology for studying educational settings. While the literature contains several examples of its application to regular education settings, the use of ecobehavioral analysis in special education settings has just begun. This paper introduces an ecobehavioral coding system (CISSAR-SPED) designed for use in special education settings. A case study is presented to exemplify the code's potential utility in educational settings for the developmentally disabled. Data are presented on the interactive effects of ecological instructional variables on student responding and the co-occurrence of student academic and competing responses. The discussion considers the implication of these data in terms of assessing the impact of ecological variables on student responding and how CISSAR-SPED data may be used to improve instructional practices in special education settings.

Introduction

Procedures for the education of developmentally disabled children and youth have received considerable attention in the special education and behavioral psychology literatures. While much of the research devoted to this topic involves careful examination of procedures (e.g., educational, behavioral), detailed objective data have most often been focused on student or teacher behavior, occasionally on the environment, and rarely on the interaction between the environment and behavior (i.e., ecobehavioral assessment).

Reviews of the research contained in the special education and behavioral psychology literature (e.g., Brantner & Doherty, 1983; Foxx & Bechtel, 1983; Luiselli, 1981) have described studies that evaluated the effects of specific interventions on the behavior of the participants of a study. Another approach to research in this area has been that of ecological psychologists who have studied educational and treatment settings. The effects of environment on behavior have been studied by ecological psychologists such as Barker (1968), Barker and Gump (1964), Lichstein and Wahler (1976), and Willems (1974). However, this method was focused on the description of behavior-environment relationships rather than on a manipulation of it (Rogers-Warren, 1984). While both of these methods yield

valuable information, the combination of the two could be more useful in the education and treatment of developmentally disabled students.

Recently, the case has been made for the study of the interaction between environment and behavior (e.g., Foster & Cone, 1980; McReynolds, 1979; Nelson & Hayes, 1979; Rogers-Warren, 1984; Rogers-Warren & Warren, 1977). McReynolds (1979) described this process as assessing the individual and environment in a systematic, objective, and integrated manner. More recently, Rogers-Warren (1984) described ecobehavioral analysis as a:

> "hybrid form of behavior analysis resulting from the incorporation of the broader definitions of behavior and environment found in ecological psychology with the functional analysis of behavior for therapeutic purposes characteristic of applied behavior analysis" (p. 287).

Such a process can yield information valuable to the education and treatment of children (e.g., Hall, Delquadri, Greenwood, & Thurston, 1982). Hall et al. (1982) provided an example of how ecobehavioral assessment led to the discovery of variables affecting the learning of regular education students (i.e., the opportunity to respond). While it has long been known that students learn through practice, it was the ecobehavioral coding system (Stanley & Greenwood, 1981) described by Hall et al. (1982) and more recently used by Greenwood, Dinwiddie, Terry, Wade, Stanley, Thibadeau, and Delquadri (1984) that objectively and systematically documented the relationship between the amount of academic responding opportunities provided to the students and their academic performance. An additional benefit of such a coding system is that it will provide data (i.e., procedural reliability) on the implementation of procedures. Thus, if an intervention is intended to manipulate instructional structure and increase academic responding, the use of an ecobehavioral code can assess whether or not the manipulation has occurred.

In recent years, research in the area of ecobehavioral assessment has expanded greatly. Furthermore, its use has taken on greater applied significance. Greenwood et al. (1984) demonstrated the utility of an ecobehavioral assessment instrument (i.e., CISSAR) in evaluating the impact of class-wide peer tutoring with inner-city children. Jones, Favell, Lattimore, and Risley (1984) described the use of a simple ecobehavioral assessment method to evaluate the effects of manipulation of leisure materials on the independent engagement of nonambulatory multihandicapped residents of a treatment facility. Carta, Greenwood and Atwater (1985) and Carta and Greenwood (1985) have introduced an ecobehavioral coding system for assessment of early intervention programs for handicapped children. The ESCAPE (Ecobehavioral System for Coded Assessments of Preschool Environments) system described by Carta et al. (1985) provides researchers with a new methodology for quantifying ecological and behavioral aspects (and their interaction) of early intervention programs that will likely effect student achievement and development. Thus, as the research with ecobehavioral assessment has advanced, so too has the range of individuals which may benefit from it (i.e., special education populations).

The need for ecobehavioral assessment of special education settings is based on the rationale provided above and the work of Brophy (1979), Cobb (1972), and Rogers-Warren (1984). While instruments for the ecobehavioral assessment of regular education settings have been developed and documented (e.g., Greenwood, 1984; Stanley & Greenwood, 1981), the need remains for an instrument to examine and analyze the ecobehavioral environments of special education classrooms.

The purpose of this paper is to: (a) describe an ecobehavioral coding system designed for use in special education settings (CISSAR-SPED); (b) present a case study in illustration of the CISSAR-SPED code's potential utility in educational settings for developmentally disabled students; and (c) discuss the implications of data collected through this system.

Code Description

The code for ecobehavioral assessment of special education classrooms described in this paper is based on the Code for Instructional Structure and Student Academic Response (CISSAR) developed by Greenwood and colleagues (Greenwood, Delquadri, & Hall, 1984; Stanley & Greenwood, 1981). While the CISSAR is an excellent tool for assessing regular educational settings, we found that a revision was necessary to the ecological and behavioral assessment needs of classrooms for special education students. These needs, as differentiated from those of regular education classrooms, reflect differences in physical and instructional groupings and identification of multiple teachers (plus aides, and peer tutors) who would provide instruction to target students. Also included is the need for coding multiple responses across the categories of academic responses, task management behavior, and inappropriate - competing behavior.

The revision of the CISSAR code developed for assessment of special education settings, **CISSAR - SPED**, is comprised of 73 codes within three main composite areas of ecological structure and teacher and student behavior (see Fig. 1). These three areas include: (a) instructional structure (34 codes); (b) teacher data (16 codes); and student behavior (23 codes). Ecological events (as in the CISSAR code) were defined as the specific joint occurrences of certain major events (e.g., ecology and teacher data). These seven events included: (a) activities (16 codes) - the subject of instruction being provided to the student (see Fig. 1); (b) task (10 codes) - the curriculum task or verbal instruction mode in which the student is expected to engage; (c) physical structure (3 codes) - the physical grouping; (d) instructional structure (5 codes) - the instructional format in which the target student is engaged; (e) teacher description (5 codes) - description of the person providing instruction to the target student (i.e., teacher, aide, peer tutor, other); (f) teacher position (5 codes); and (g) teacher behavior (6 codes). This provided for a wide representation of ecological contexts within the coding system.

Student behavior was represented by 24 individual codes and three composites. The composites included: (a) academic responses; (b) task management behavior; and (c) competing behavior. The academic response composite consisted of nine codes; eight behaviors in which the student could be actively engaged (i.e., writing, playing academic game, reading aloud, reading silently, talking appropriately, answering academic question, asking academic question, and task participation), and one code to indicate the absence of an academic response (i.e., "none"). The task management composite was defined by five behaviors (i.e., waiting, raising hand, looking for materials, move to new location, and playing appropriately) and one code to indicate the absence of a task management behavior ("none"). The competing behavior composite was comprised of eight behaviors (i.e., disrupt, playing inappropriate, inappropriate task, talking inappropriate, inappropriate locale, looking around, self-stimulation, and self-abuse) plus a code to indicate no competing behavior ("none").

Use of the CISSAR - SPED code involved a 10 second momentary time sample procedure. At the onset of the first 10 second interval the observer coded the string containing the codes for activity, task, physical structure, and instructional structure (see Fig. 2). Ten seconds later the teacher(s) description, teacher(s) position, and teacher(s) behavior were scored. If a person other than the head teacher (i.e., aide, peer tutor, etc.) was providing instruction to a target student at the time of the momentary sample then teacher description, position, and behavior were coded for both the head teacher and the other person. At the onset of the third 10 second interval (20 seconds after the first signal) student behavior was scored. This included academic responses, task management behavior, and inappropriate - competing behavior. Thus, the 30 second cycle allowed for repeated measurement of the three composites (i.e., instructional structure, teacher behavior, & student behavior).

Case Study

The student whose data are presented here had been diagnosed as autistic by psychologists not associated with the study. He was 18 years old and enrolled in a work activities center run by a Mid-Western public school system. Data were collected by specially trained CISSAR-SPED observers during two hour scheduled blocks of time during the students workshop training sessions.

The data presented below were collected during a study on instructional methods with autistic and developmentally disabled students. The analyses illustrated here represent only two of the numerous ones possible with data generated through the CISSAR-SPED code. The first is the relationship of instructional structure to student academic responding. The second is the relationship of academic responding to competing responses. These analyses were chosen for illustration since they address issues of current and applied significance in the education of autistic and developmentally disabled students.

Figure 1 CISSAR - SPED CATEGORIES

Instructional Context Categories

Activities

1. Reading
2. Mathematics
3. Spelling
4. Handwriting
5. Language
6. Science
7. Social Studies
8. Pre-Voc./Vocational
9. Motor Skills
10. Daily Living Skills
11. Self-Care Skills
12. Arts/Crafts
13. Free Time
14. Class Business/Mgmt.
15. Transition
16. Can't Tell

Tasks

1. Readers
2. Workbook
3. Worksheet
4. Paper/Pencil
5. Listen to Lecture
6. Other Media
7. Teacher/Student Disc.
8. Fetch/Put Away
9. Time Out
10. None

Structures Physical

1. Entire Group
2. Small Group
3. Individual

Structure Instructional

1. Instruction to Entire Group
2. Instruction to Small Group
3. One to One
4. Independent Activity
5. No Assigned Activity

Teacher Description

1. Head Teacher
2. Aide #1
3. Aide #2
4. Peer Tutor
5. Other

Teacher Position

1. In Front
2. In Back
3. Side
4. Back
5. Out of Room

Teacher Behavior

1. No Response
2. Teaching
3. General Teaching
4. Other Talk
5. Approval
6. Disapproval

Student Behavior Categories

Academic Responding

1. Writing
2. Academic Game Play
3. Reading Aloud
4. Reading Silent
5. Talking Academic
6. Answers Academic Quest
7. Asks Academic Question
8. Task Participation
9. None

Task Management

1. Waiting Appropriately
2. Raising Hand
3. Looking for Materials
4. Moves to New Academic Station
5. Playing Appropriately
6. None

Competing Behavior

1. Disrupt
2. Playing Inappropriately
3. Inappropriate Task
4. Talking Inappropriately
5. Inappropriate Locale
6. Looking Around
7. Self-Stimulation
8. Self-Abuse
9. None

Special Education CISSAR

__:__
Start R M S H L Sc Ss Ac Ft Rr Wb Ws Pp Ll Eg Sg I Ie Is 1:1 Ia Nn
Bm Tn Ct Pv Ms Dl Sf Om Tsd Fp To N

1 If AD O S B NR Gn T OT A D __:__ _____
1 2 3 4 5 If AD O S B NR T OT A D Stop Stop Code

W G RA RS TA ANQ ASK TP NS WA RH LM M PA NT DI PI IT TNA IL LA SST SA NI

__:__
Start R M S H L Sc Ss Ac Ft Rr Wb Ws Pp Ll Eg Sg I Ie Is 1:1 Ia Nn
Bm Tn Ct Pv Ms Dl Sf Om Tsd Fp To N

1 If AD O S B NR Gn T OT A D __:__ _____
1 2 3 4 5 If AD O S B NR T OT A D Stop Stop Code

W G RA RS TA ANQ ASK TP NS WA RH LM M PA NT DI PI IT TNA IL LA SST SA NI

__:__
Start R M S H L Sc Ss Ac Ft Rr Wb Ws Pp Ll Eg Sg I Ie Is 1:1 Ia Nn
Bm Tn Ct Pv Ms Dl Sf Om Tsd Fp To N

1 If AD O S B NR Gn T OT A D __:__ _____
1 2 3 4 5 If AD O S B NR T OT A D Stop Stop Code

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__:__
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Bm Tn Ct Pv Ms Dl Sf Om Tsd Fp To N

1 If AD O S B NR Gn T OT A D __:__ _____
1 2 3 4 5 If AD O S B NR T OT A D Stop Stop Code

W G RA RS TA ANQ ASK TP NS WA RH LM M PA NT DI PI IT TNA IL LA SST SA NI

__:__
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Bm Tn Ct Pv Ms Dl Sf Om Tsd Fp To N

1 If AD O S B NR Gn T OT A D __:__ _____
1 2 3 4 5 If AD O S B NR T OT A D Stop Stop Code

W G RA RS TA ANQ ASK TP NS WA RH LM M PA NT DI PI IT TNA IL LA SST SA NI

__:__
Start R M S H L Sc Ss Ac Ft Rr Wb Ws Pp Ll Eg Sg I Ie Is 1:1 Ia Nn
Bm Tn Ct Pv Ms Dl Sf Om Tsd Fp To N

1 If AD O S B NR Gn T OT A D __:__ _____
1 2 3 4 5 If AD O S B NR T OT A D Stop Stop Code

W G RA RS TA ANQ ASK TP NS WA RH LM M PA NT DI PI IT TNA IL LA SST SA NI

Table 1 presents a comparison of student behavior across teaching formats. It should be noted that the student response codes presented are indicative of those that occurred during the two observations and do not represent all of the responses included in the code (e.g., Figures 1 & 2). Additionally, all percentages have been rounded off to the nearest 1%.

The data in Table 1 depict the specific student responses that occurred and the instructional structures under which they were recorded. An important aspect of these data is that academic, task management, and competing responses are not mutually exclusive. Thus, it was possible to record an academic plus a task management or competing response during the same observation interval. This feature was of major interest during the development of the CISSAR-SPED code since it would enable the analysis of co-occurrence of responses in academic, task management, and competing response classes. This issue is particularly relevant to the area of educating autistic students since it is often assumed that self-stimulatory and other competing behaviors interfere with academic performance. Co-occurrence data allow for empirical analysis of this question.

Examination of Table 1 reveals that during Observation 1, 53% of intervals occurred under the structure of Independent Activity (IA), 15% occurred under 1:1, and 31% occurred under No Assigned Activity (NN). Furthermore, the majority of academic responses (49%) occurred under the IA structure and consisted solely of TP (Task Participation). Only 9% of academic responses occurred under other conditions (i.e., 1:1), with ANQ (Answers Academic Question) = 7% and TA (Talking Academic) = 2%. Task management responses were scarce except in the absence of an instructional structure (i.e., NN). They were present during 5% of intervals under IA conditions (LM [Looking for Materials] = 4%, M [Moves to New Academic Station] = 1%), 5% of intervals under 1:1 conditions (WA [Waiting Appropriately] = 4%, M = 1%), and 31% of intervals under NN conditions (WA = 24%, LM = 4%, M = 4%). Competing responses occurred during 55% of intervals. Of this total, 32% were recorded under IA instructional conditions (SST [Self-Stimulatory Behavior] = 23%, TNA [Talking Inappropriate] = 5%, LA [Looking Around] = 4%), 9% under 1:1 (SST = 7%, LA = 2%), and 14% under NN conditions (SST = 7%, TNA = 4%, LA = 3%). Also depicted in Table 1 are the frequency and percentage data for Observation 2 with the same autistic student. They reveal that 63% of intervals occurred under IA conditions, 7% under 1:1, 18% under Instruction to a Small Group (IS), 1% under Instruction to Entire Group (IE), and 12% under No Assigned Activity (NN). In the area of academic responses the majority, as in Observation 1, occurred under the IA instructional structure. They consisted mainly of Task Participation (TP) responses (52%), with 1 Answers Question (ANQ) response (1%). Only 6% of academic responses occurred during 1:1 conditions (TP = 5%, ANQ = 1%). The remaining academic responses occurred under IS (ANQ = 1%, TP = 2%) and IE (ANQ = 1%) instructional structures.

Task management responses occurred most frequently under IS instructional conditions (12%) with WA accounting for 11% and M for 1%. They occurred during 11% of intervals under NN conditions

Table 1

Student Behavior Comparisons Across Teaching Structures

Structures		Student Response Classes														
Type/Frequency/ Percent		Academic Responses				Task Management					Competing Responses					
		CP	ANQ	TP	NS	CP	WA	LM	M	NT	CP	SST	TNA	LA	NI
Observation 1																
IA	73	67	0	67	6	6	0	5	1	67	44	32	7	5	29
	53%	49%	-	49%	4%	4%	-	4%	1%	49%	32%	23%	5%	4%	21%
1:1	21	13	10	3	8	7	6	0	1	14	13	10	0	3	8
	15%	9%	7%	2%	6%	5%	4%	-	1%	10%	9%	7%	-	2%	6%
IS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NN	43	0	0	0	43	43	33	5	5	0	19	10	5	4	24
	31%	-	-	-	31%	31%	24%	4%	4%	-	14%	7%	4%	3%	18%
BASE = 137																
Observation 2																
IA	106	88	1	87	18	16	7	1	8	90	73	51	17	5	33
	63%	52%	1%	52%	11%	10%	4%	1%	5%	54%	43%	30%	10%	3%	20%
1:1	11	10	2	8	1	1	1	0	0	10	7	7	0	0	4
	7%	6%	1%	5%	1%	1%	1%	-	-	6%	4%	4%	-	-	2%
IS	30	5	2	3	25	20	19	0	1	10	20	13	5	2	10
	18%	3%	1%	2%	15%	12%	11%	-	1%	6%	12%	8%	3%	1%	6%
IE	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1
	1%	1%	1%	-	-	-	-	-	-	-	-	-	-	-	1%
NN	20	0	0	0	20	18	18	0	0	2	17	9	7	1	3
	12%	-	-	-	12%	11%	11%	-	-	1%	10%	5%	4%	1%	2%
BASE = 168																

Note: Table abbreviations are as follows. CP = Composite, ANQ = Answers Academic Question, TP = Task Participation, NS = No Academic Response, WA = Waiting, LM = Looking for Materials, M = Moves to New Academic Station, NT = No Task Management Response, SST = Self-Stimulatory Behavior, TNA = Talking Inappropriate, LA = Looking Around, NI = No Competing Response. Structures: IA = Independent Activity, 1:1 = One-To-One, IS = Instruction to a Small Group, IE = Instruction to Entire Group, NN = No Assigned Activity

(WA = 11%). They were nearly as frequent during IA conditions (10%) with M accounting for 5%, WA for 4%, and M for 1% of responses. The remaining task management response was recorded under a 1:1 instructional structure (i.e., WA = 1%).

Competing responses in Observation 2 were most prevalent during IA instructional conditions (43%). Of this total 30% were SST, 10% TNA, and 3% LA. There were competing responses during 12% of IS instructional conditions, comprised of SST (8%), TNA (3%), and LA (1%). There were competing responses during 10% of intervals under NN conditions (SST = 5%, TNA = 4%, LA = 1%). The only other competing responses recorded during this observation were during 1:1 instructional conditions and were comprised solely of SST (4%).

Table 2 presents data on the co-occurrence of academic and competing responses by the subject of this case study. As with Table 1, the percentage figures have been rounded off to the nearest 1%. These data reveal the co-occurrence of two different academic responses with one or more competing responses. In Observation 1, there were 21% of intervals in which both TP and SST were recorded, 4% of intervals with both TP and TNA, and 7% of intervals with both TP and LA. Additionally, ANQ and TNA were recorded together in 4% of intervals. During Observation 2, TP and SST co-occurred in 27% of intervals, TP and TNA in 10%, and TP and LA in 2% of intervals. ANQ and TNA were present together in 1% of intervals observed.

The data presented in Tables 1 and 2 provide the basis for analyses of the relationship between: a) instructional structure and student academic responding; and b) academic responding and competing behavior for the autistic subject of the case study. Table 1 reveals that the student spent the majority of Observation 1 under an Independent Activity instructional structure. While 49% of total intervals in this observation were spent engaged in academic responding under Independent Activity conditions, it is important to note that this figure also represents an academic responding level of 92% under this instructional structure. This compares to 13% of total intervals with academic responding under a 1:1 instructional structure or a 62% academic responding rate. During Observation 2, where all four instructional structures were used as compared to only two in Observation 1, the results were different. Data from Observation 2, in which an experimental small group instructional format was used during part of the observation, reveals that 52% of total intervals were recorded under an Independent Activity instructional structure with accompanying academic responding. This represented an academic responding rate of 83% during these conditions. In contrast to Observation 1, 6% of the total intervals occurred under a 1:1 instructional structure with accompanying academic responding, representing an academic responding rate of 91%. Also evident in Observation 2 is that under the Instruction to a Small Group structure academic responding occurred in 17% of observation intervals.

Table 2

Co-occurrence of Academic and Competing Responses

Academic Response	Competing Response		
Observation 1			
	SST	TNA	LA
TP	29	6	9
	21%	4%	7%
ANQ	0	6	0
	--	4%	-
Base = 137			
Observation 2			
	SST	TNA	LA
TP	46	16	4
	27%	10%	2%
ANQ	0	1	0
	--	1%	-
Base = 168			

Note: Table abbreviations are as follows. TP = Task Participation, ANQ = Answers Academic Question, SST = Self-Stimulatory Behavior, TNA = Talking Inappropriate, LA = Looking Around.

In summary, Table 1 shows that a wider range of instructional structures occurred during Observation 2 and that academic responding rates differed under certain instructional structures from Observation 1 to Observation 2. It is important to note that the number of intervals varied greatly across instructional conditions and this should be considered along with percentage data on academic responding (e.g., 100% academic responding during IE in Observation 2 = 1 of 1 interval; 83% academic responding during IA in Observation 2 = 88 of 106 intervals).

Table 2 presents the co-occurrence of academic responding and competing responses during Observations 1 and 2. Evident in these data is the significant amount of co-occurrence between the academic response of Task Participation (TP) and various competing behaviors. The most frequent co-occurrence was between TP and SST (Self-Stimulatory Behavior). This accounted for 21% of total observation intervals or 41% of intervals during which TP was recorded (n = 70) during Observation 1 and 46% of total intervals or 47% of intervals with TP during Observation 2. Also of importance were co-occurrences of TP and Talking Inappropriate (TNA) responses during 4% of total intervals in Observation 1 (9% of intervals during which TP was scored) and 10% of total intervals during Observation 2 (16% of intervals with TP). There were 7% of total intervals during Observation 1 where TP and Looking Around (LA) were both recorded (13% of intervals with TP) and 2% of total intervals in Observation 2 with the same co-occurrence (4% of TP intervals). Finally, Answers Academic Question (ANQ) was recorded during the same interval as TNA a few times during each observation. This represented 4% of intervals in Observation 1 (or 60% of intervals with ANQ) and 1% of intervals in Observation 2 (or 1% of intervals with ANQ).

An important feature of the co-occurrence data in Table 2 is that it documents that academic and competing responses are not necessarily mutually exclusive; in fact they were quite frequent. A surprising result was that in over 40% of observation intervals where TP (the most frequent academic behavior) occurred, so did SST (i.e., 41% in Observation 1, 47% in Observation 2). This appears to contradict the assumption that self-stimulatory behavior <u>necessarily</u> interferes with academic responding. Additionally, there were several instances in both observations where Talking Inappropriate (TNA) and Looking Around (LA) also did not interfere with co-occurring academic responses.

Discussion

The data generated through the use of the CISSAR-SPED code provide information on several variables related to the education of special education students. CISSAR-SPED data presented in the case study revealed: a) a change in the variety of instructional structures used with the student; b) the implementation of an independent variable, namely a small group instructional format (IS); c) that the most frequent academic response was Task Participation (TP); and d) that there were frequent co-occurrences of academic and competing responses, most notably the co-occurrence of Task Participation and Self-Stimulatory behavior. As stated earlier, these variables and analyses represent a small portion of those

possible with data generated through the use of the CISSAR-SPED code. They are presented to illustrate the potential utility of the code for ecobehavioral analysis of instructional, teacher, and student behavior characteristics in special education settings.

While the data presented in this paper illustrate some potential uses for CISSAR-SPED data, they are limited by the nature of a case study (i.e., n = 1). Furthermore, it is possible that the data may represent idiosyncrasies of the subject rather than behavior generalizable to other autistic and developmentally disabled students. This is an empirical question that may be answered through further use of the code with similar subjects. Nevertheless, data showing the simultaneous occurrence of academic and competing responding is noteworthy. The co-occurrence of academic and self-stimulatory behavior is of even more importance, given the emphasis placed on eliminating such inappropriate responding with this population and the common belief that this behavior interferes with learning and performance. Perhaps through further use of the code a broader picture will emerge of the relative frequency with which self-stimulatory behavior does and does not interfere with academic responding and what ecobehavioral contexts correlate with the presence or absence of such behavior.

In conclusion, it appears that much useful information could be gained about ecobehavioral variables within special education through the use of the CISSAR-SPED code. Just as the CISSAR code (Stanley & Greenwood, 1981) led to the discovery of variables affecting the learning of regular education students, it is possible that the CISSAR-SPED code will lead to similar discoveries with special education students (e.g., autistic). It was for this purpose that the CISSAR-SPED code was developed.

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CHAPTER III

AN ECOBEHAVIORAL LOOK AT DISRUPTIVE CLASSROOM BEHAVIOR AND ACADEMIC ACHIEVEMENT

BARBARA JEAN TERRY

Abstract

The thesis of this review is that disruptive classroom behavior distracts and interferes with educational instruction from the teacher and competes with the academic engaged time of the students in that classroom. Years of research have given us a technology of classroom management or control over disruptive classroom behaviors. The focus now is for making the time in instruction (uninterrupted by disruptive behaviors), more academically productive. This paper takes an ecobehavioral look at the entities of (1) disruptive classroom behaviors, (2) the ecological perspective, and (3) academic achievement. It examines the terminology and definitions and explores the importance or purpose of each entity, backed by supported by verified research in the literature. It extracts from this literature basic findings which seem most effective in providing the greatest academic gains. An underlying theme focuses on the "marriage" of behavior analysis techniques to those of ecological psychology, as an effective means of producing accelerated achievement gains. In addition, an update is provided on the status of the "cold war" that has been in effect between the two disciplines of ecological psychologists (the Hatfields) and that of the behavior analysts (the McCoys) and an interpretation as to whether or not their age old "family feud" has really ended.

Introduction

Within the classroom setting, learning and educational growth can only take place if there are no other behaviors competing with the educational instruction. Behavior analysts have conducted hundreds of studies demonstrating that disruptive classroom behavior which directly competes with learning, can be manipulated, controlled or changed. Ecologists have proven that one cannot isolate behavior without also examining the environmental variables which may contribute to and/or maintain certain behaviors, and once learning takes place, there are various ways to affect and increase academic achievement. When it is all said and done, the question arises, since each particular discipline has contributed so much to its own field, why then are we not combining the best of both worlds and creating programs and procedures which incorporate the combination of this vast knowledge? For many years, the "Hatfields" (the ecological psychologists) and the "McCoys" (the behavior analysts) have gone their separate ways, doing their "own thing", and continuing the age old feud that only their own approach was the best. As a result, neither side needed or wanted anything to do

with the other. More recently however, there has been a crossing of the paths, and each has openly acknowledged the awareness and worthy contributions of the other. Could the feud be nearing an end?

Disruptive Classroom Behaviors

Disruptive classroom behavior is a "catch-all" phrase which encompasses several different behaviors all of which compete or interfere with academic learning. Some disruptive behaviors include talk-outs, out-of-seat behavior, classroom noise, aggressive, distractive and oppositional behavior, non-compliant behavior, off-task behavior, fighting, non-attending behavior, daydreaming, disputing, vandalism, dawdling, and the list could continue on and on. The important fact about any and all of these disruptive classroom behaviors is that they all distract the students and interfere with teaching behavior and learning acquisition. When disruptive behaviors occur in the classroom, there is competition for the instructional time and interference with the opportunity to learn.

Behavioral Perspective

Disruptive classroom behaviors have been the focus of applied behavior analysts for many years. Baer, Wolf and Risley (1968) described applied behavior analysis as a discovery-oriented, self-examining, self-evaluating research procedure for studying behavior. Behavior analysts investigate variables which can be effective in improving the behavior under examination. These researchers posit that in behavioral applications, the behavior is selected in its usual social setting due to its importance to mankind and the society in general, rather than for its importance to a discipline or theory. The behavior analysts must provide a believable demonstration of control over the occurrence or non-occurrence of the behavior. The two most commonly used designs for such control are the "reversal" and the "multiple baseline" design techniques. The essential criterion of applied behavior analysis is the power of an intervention to change or alter the specific behavior.

Disruptive classroom behaviors can actually prevent a child from making maximum use of school time in the classroom environment. Numerous behavioral research efforts indicate that the systematic application of operant conditioning techniques has been highly effective in modifying a variety of disruptive classroom behaviors. Through the use of various techniques such as (a) teacher training and contingent attention, (b) token reinforcement systems, (c) group contingency techniques, (d) "good behavior game" implementation, (e) timeout procedures, (f) self-control procedures, and (g) other external reinforcement procedures, many classroom behavioral problems have been systematically decreased. Research in each of these techniques is discussed below.

(a) Teacher training and contingent attention. Teacher attention is an intrinsic reinforcer in every classroom. One important classroom management technique is to train a teacher in the proper use of their attention to approve, praise and reward appropriate classroom behaviors. A number of studies (Broden,

Bruce, Mitchell, Carter, & Hall, 1970; Cooper, Thomson, & Baer, 1970; Hall, Fox, Willard, Goldsmith, Emerson, Owen, Davis, & Porcia, 1971; Hall, Lund, Jackson, & Broden, 1968; Hall, Panyan, Rabon, & Broden, 1968; Jones, Fremouw, & Carples, 1977; Kazdin & Klock, 1973; Madsen, Becker, & Thomas, 1968; McAllister, Stachowiak, Baer, & Conderman, 1969; Pfiffner, Rosen, & O'Leary, 1985; Schutte & Hopkins, 1970; Thomas, Becker, & Armstrong, 1968; Ward & Baker, 1968; Wasik, Senn, Welch, & Cooper, 1969) have shown that teachers could be trained to use their attention and praise to decrease disruptive behavior and increase appropriate behaviors through modifying contingencies of reinforcement in the classroom environment. For example, Broden et al. (1970) utilized teacher attention and praise in a reversal design to increase the attending behavior of the two most disruptive boys in a second grade classroom. The classroom teacher was trained to attend to the appropriate attending behavior of one boy only, and then the other boy only. A return to baseline was implemented, and in the final condition, the teacher provided contingent attention to appropriate attending behavior in both boys. Results indicated that the disruptive behaviors of both boys had decreased and the attending behaviors increased with contingent teacher attention. Similarly, Cooper et al. (1970) trained two preschool classroom teachers to attend to appropriate student responses. A multiple baseline design was used with each teacher which consisted of three sequential conditions: a) a baseline period; b) a training period; and c) a probe. Data indicated that this simple training procedure modified teacher behavior to increase their attentive behavior to appropriate child responses. This contingent attention resulted in an increase of appropriate student behaviors.

(b) Token reinforcement systems. Ayllon and Roberts (1974), Birnbrauer, Wolf, Kidder, and Tague (1965), Carden-Smith and Fowler (1984), Chadwick and Day (1970), Hundert (1976), O'Leary, Becker, Evans, and Saudargas (1969), Packard (1970), Ringer (1973), Robertson, DeReus, and Drabman (1976), Robinson, Newby, and Ganzell (1981), Speltz, Shimamura, and McReynolds (1982) and Wolf, Giles, and Hall (1968) have demonstrated the effectiveness of the token economy system to reduce disruptive classroom behaviors and/or increase academic behaviors. Ayllon and Roberts (1974) eliminated discipline problems by strengthening academic performance on five disruptive fifth-grade boys. During reading, the teacher conducted a fifteen-minute performance session in which written academic performance and disruptive behavior were recorded. During this phase, the boys' average level of disruption was 34%, while their reading performance was below 50%. When a systematic token reinforcement system was implemented to reading performance only, the rate of disruption fell dramatically, and reading performance increased. Later, the reinforcement procedure was withdrawn, reading performance declined and disruptive behavior increased. Again, the reinforcement procedure was reinstated, and reading performance doubled while disruptive behavior was eliminated.

In another study, thirty black and hispanic underachieving students ranging in ages from eight to twelve years served as subjects for Chadwick and Day's (1971) investigation of the effects of contingent tangible and social reinforcement on academic

performance. Two experimental treatment conditions were compared. During treatment I, the reinforcement program of social reinforcers from the teacher and aides, and tangible backup reinforcers for points earned for classroom work were implemented. The point system was used to reinforce academic work and appropriate social classroom behaviors. Students redeemed these points for the following reinforcers: lunch (25 points); school store items (varying points); and field trips (varying points). The following measures of academic performance were monitored: 1) percent of time engaged in academic activities (total work time); 2) number of problems or units of work completed (work completion); and 3) percent correct (accuracy). During treatment II, the point system was terminated to assess the effects of the social reinforcement alone. The results revealed that with combined tangible and social reinforcers, students' total work time, accuracy, and work completion increased. When tangible reinforcers were withdrawn, high rates of output and accuracy were maintained by the students, but their total work time returned to baseline levels. Token reinforcement systems are an effective way of increasing academic achievement and decreasing disruptive classroom behaviors.

(c) Group contingency techniques. The application of group contingency techniques and its effect on decreasing disruptive classroom behaviors have been studied by researchers such as Greenwood, Hops, Delquadri, and Guild, 1974; Packard, 1970; Saigh and Umar, 1983; Schmidt and Ulrich, 1969; Speltz et al., 1982; and Zimmerman, Zimmerman, and Russell, 1969. Greenwood et al. (1974) evaluated the relative effects of rules, rules plus feedback, and rules plus feedback plus group and individual consequences for appropriate behavior in three elementary classrooms during math and reading periods. The consequences were group and individual praise, and the opportunity for group activities. The total intervention package with all components (rules plus feedback plus group and individual consequences) was more effective in increasing appropriate classroom behaviors, than any of the other treatments. Rules plus feedback resulted in increases in appropriate behavior in two of the classrooms, and rules alone produced no changes in any classroom behavior. In two of the three classrooms, teachers' correct use of praise maintained appropriate classroom behavior at the same level as when the total package was implemented.

Schmidt and Ulrich (1969) looked at the effects of group-contingency events upon classroom noise and out-of-seat behavior. Both positive reinforcement (two-minute addition to gym class, and two-minute break for appropriate behavior) and punishment (response cost; loss of five minutes of gym period for violating sound level rules and out-of-seat behavior) were utilized. After ten minutes of "quiet" as measured on a decibel meter, the reinforcement procedure was implemented. Failure to achieve criterion sound levels resulted in recycling the timer. Follow-up investigations revealed that behavioral gains had maintained one year later. Group contingency techniques can reduce and maintain low levels of disruptive behaviors.

(d) The "good behavior game" implementation. The technology for successfully managing classroom behavior has undergone considerable changes. Imagine the use of a game in the classroom to

eliminate disruptive behaviors. As a specific example of the group contingency technique, one such powerful procedure was designed to reduce disruptive classroom behaviors by means of playing a game involving competition within a classroom for various class privileges. The game was called the "good behavior game" and the game and modifications of the game were used and replicated by Barrish, Saunders, and Wolf (1969), Fishbein and Wasik (1981), Harris and Sherman (1973a), Medland and Stachnik (1972), Saigh and Umar (1983) and Warner, Miller, and Cohen (1977). Barrish et al. (1969) investigated the effects of the "good behavior game" on out-of-seat and talkout behaviors in a fourth grade classroom. The group game established group consequences dependent on appropriate behavior of individual team members. A reversal design was used during the math period, and a multiple baseline design was used first in the math period, then during the reading period. The punishment techniques of the group contingency game decreased inappropriate behaviors. The average score per interval for talkout behavior declined from 96% to 19% and out-of-seat behavior declined from 82% to 9%. The research by Harris and Sherman (1973a) which replicated the procedures of the "good behavior game" in two classrooms, resulted in reduced disruptive talking and out-of-seat behaviors in both fifth and sixth grade students. Each classroom was divided into two teams and the members of each team were posted on the blackboard along with the rules of the "good behavior game". Rules included: 1) no talking without permission; 2) no leaving a seated position without permission; and 3) no throwing objects in the classroom without permission. Permission could be obtained by students raising their hands and receiving teacher consent. The teacher then outlined the contingencies related to the game. Anytime a team member broke one of the rules, a mark was placed on that teams' board. The team with the fewest number of marks at the end of the period would be the winning team. If neither team received more than the specified number of marks (five marks for fifth grade and four marks for sixth grade), both teams would be winning teams. Each member of the winning team was allowed to leave school ten minutes early at the end of the day. Thus, team competition procedures involving entire team consequences were successful in reducing disruptive classroom behaviors.

(e) Timeout procedures. Researchers have demonstrated that disruptive behaviors in the classroom could be manipulated as a function of the timeout procedure. Timeout is a procedure in which the target student is removed from any social reinforcing situation for a specified amount of time for exhibiting inappropriate behavior. Foxx and Shapiro (1978) utilized a timeout procedure which did not require removal from the learning environment. They used a timeout ribbon procedure which was applied to the disruptive behavior of five severely retarded children. An ABCBC reversal design was used to demonstrate the control of the disruptive behaviors. A different colored ribbon was tied to each child. Children received praise and edibles every few minutes for wearing the ribbon and emitting appropriate behavior. When the timeout procedure was added, a child's ribbon was removed for inappropriate behavior, and teacher praise and participation in activities ceased for three minutes or until the inappropriate behavior stopped. The children misbehaved 42% of the time during baseline, 32% of the time

during the reinforcement condition, and only 6% of the time during the timeout ribbon condition. This study demonstrated that the timeout ribbon procedure was effective, providing that disruptive behaviors could be tolerated within the setting during the timeout condition.

Lahey, McNees and McNees (1973) modified an obscene "verbal tic" behavior of a ten year old student. This student had a high rate of inappropriate behavior of obscene vocalizations accompanied by facial twitches. Overcorrection of repeating the obscene words rapidly for fifteen minutes four times a day reduced the behavior but not to an acceptable level. Thus, a timeout procedure was implemented whereby the student was immediately placed in a timeout room for a minimum of five minutes and until he was quiet and calm for one minute after every inappropriate target behavior. The timeout contingency reduced the obscene vocalizations to a level below that of the repetition phase, and maintained it at low acceptable levels.

Ramp, Ulrich and Dulaney (1971) conducted a case study using a delayed timeout procedure on the disruptive classroom behavior of a nine year old boy. Out-of-seat and talk-out behaviors were eliminated by the illumination of a red light which was placed on the student's desk during the observation sessions only. Instructions alone did not reduce the disruptive behaviors, but illumination of the light resulting in the loss of free time later in the day (delayed timeout) drastically reduced the disruptive behaviors. The student was instructed that everytime he talked out or left his seat without permission, the light would be turned on and he would lose five minutes of recess or gym time which was to be spent in a booth outside the classroom in the hallway. During baseline, out-of-seat behavior was at 23.7 per interval, and talk-outs were at 17.1 per interval. During the instructions phase in which the student was to raise his hand before leaving his seat or talking, the behaviors rose to 29.6 per interval for out-of-seat and 22 per interval for talk-outs. During the delayed timeout phase with the red light resulting in loss of free time, the disruptive behaviors dropped and the subject left his seat only two times and talked without permission only six times, thus spending a total of forty minutes in the timeout booth. Delayed timeout was a very effective way to reduce this student's disruptive classroom behaviors.

(f) Self-control procedures. Disruptive classroom behaviors have been successfully decreased by student self-control procedures which include self-assessment (Thomas, 1976), self-control (Glynn, Thomas, & Shee, 1973; Rosenbaum & Drabman, 1979), self-evaluation (Rhode, Morgan, & Young, 1983), self-regulation (Bolstad & Johnson, 1972), and self-imposed contingencies (Lovitt & Curtiss, 1969). In the study by Thomas (1976), thirty-one second grade students were observed to determine how well they could accurately assess their own academic on-task behavior (self-assessment). For eight weeks, daily observation sessions were conducted during the math lesson. A five-phase reversal design (ABABC) was utilized. Baseline periods were "A" phases; self-control periods were "B" phases, and a post-check represented the "C" phase of the design. The teacher instructed all children to put a mark on their individual

performance cards when the signal sounded and they were on task. If they were not on task at the signal, they were instructed not to touch their cards. Fifteen to twenty signals sounded during the forty minute math session. Observers measured the children's self-assessment accuracy during the "B" phases, and results indicated that the overall level or accuracy for the classroom was 78%. The results also demonstrated that this self-assessment technique could increase on-task behavior, and the post-check ("C" phase) revealed that these techniques could have a lasting effect (maintained at two months follow-up).

After establishing appropriate classroom behaviors via an externally administered token reinforcement system, Glynn et al. (1973) examined the behavior maintenance capacity of self-control treatment procedures on on-task behavior with a regular second grade class of 37 students. Behavior observations were made daily during a thirty minute reading period. Some aspects of all four components of self-control (self-assessment, self-recording, self-determination of reinforcement, and self-administration of reinforcement) were utilized. The results of the study demonstrated that high rates of on-task behavior could be successfully maintained by second grade children in the regular classrooms via behavioral self-control procedures. Rhode et al. (1983) utilized self-evaluation procedures with six behaviorally handicapped elementary school students. A multiple baseline across pairs of subjects design was used. These students were taught to evaluate their own behavior in the resource room and the regular classroom. These self-evaluations resulted in generalized improved appropriate behavior in both settings.

Bolstad and Johnson (1972) compared external-regulation and self-regulation procedures in the treatment of disruptive classroom behavior of the four most disruptive children from several first- and second-grade classrooms. Students were taught to self-observe their own disruptive behavior. The students were later given control over dispensing reinforcement to themselves. Data revealed that both external-regulation and self-regulation procedures reduced disruptive classroom behavior. Self-regulation procedures, however, were more effective in reducing disruptiveness.

(g) Other external reinforcement procedures. Numerous reinforcement techniques have been utilized to decrease disruptive classroom behaviors. There are as many other reinforcement techniques as there are students on which to use them. Researchers have implemented various techniques to eliminate inappropriate classroom behaviors such as out-of-seat behavior, talking aloud, off-task behavior, vandalism, noise level, etc. Other effective procedures used to decrease disruptive classroom behaviors are multiple reinforcement procedures and/or packages (Cossairt, Hall, & Hopkins, 1973; Hundert, 1976; Jones et al., 1977), contingency contracting and good behavior contract (Kelley & Stokes, 1982; White-Blackburn, Semb, & Semb, 1977), free-time and access to recreational activities (Aaron & Bostow, 1978; Osborne, 1969; Rapport & Bostow, 1976), and the use of study guides and self-scoring (Farnum & Brigham, 1978). Still other behavior analysts, have used various reinforcement procedures which included social reinforcement (Greer & Polirstok, 1982; Pfiffner et al., 1985),

delayed reinforcement (Schwarz & Hawkins, 1970), candy as reinforcement (Coleman, 1970), non-verbal teacher approval (Kazdin & Klock, 1973), music as reinforcement for reduced noise level (Wilson & Hopkins, 1973), differential reinforcement of low occurring behaviors, DRL, (Deitz & Repp, 1973), vicarious reinforcement (Kazdin, 1973), peer reinforcement (Solomon & Wahler, 1973), and daily report cards with home-based consequences (Todd, Scott, Bostow, & Alexander, 1976).

In conclusion, all the aforementioned research provides verifiable demonstrations that disruptive classroom behaviors can be successfully manipulated given the proper application of the controlling environmental contingencies.

Ecological Perspective

For the purpose of this paper, "ecological psychology" is defined as the system of intrapersonal behavior which focuses on an individual within the contingency and physical milieu (Rogers-Warren & Warren, 1977). The ecological perspective incorporates such terminology as eco-systems, environmental organization, ecological control, environmental units and designs, behavioral settings, milieu, environmental problems, setting variables, and environmental structure such as the size and the geographic and physical make up of an environmental setting. Henceforth, ecological psychologists have primarily dealt with the ecology. Ecological psychology emphasizes non-manipulative examination of organism-environment interdependencies. It further implies a need to investigate "networks" or relationships via direct observations. Willems (1974) stated that the central interest of the ecological perspective on behavior includes the behavioral adaptive dependencies between an organism and its environment, and that these interdependencies are little understood.

More recently however, the paths of the behavior analyst and the ecological psychologist have crossed. Ecology primarily focuses on the environment, whereas, applied behavior analysis focuses on altering respondent behavior(s). Thus, a combination of the two (ecological and applied behavior analysis) provides an ecobehavioral perspective which bridges the gap and provides an alternative when behavioral endeavors are planned, to utilize a measurement system which can detect ecological outcomes as well. The ecobehavioral technology examines the effects of the environment on behavior. Rogers-Warren (1984) defined ecobehavioral analysis as "an area of applied behavior analysis that reflects a modified perspective on environment-behavior relationships (p. 285).

The main focus of ecobehavioral analysis is on developing a better understanding of these complex interdependencies and interrelationships within organism-behavior-environment systems. As Greenwood, Schulte, Kohler, Dinwiddie, & Carta (1985) have stated, the current emphasis in behavioral assessment is the analysis of ecology-behavior interactions. These ecobehavioral interactions are based upon observing and recording the minute-to-minute interactions of the environmental stimuli and the student's behavior. They defined ecobehavioral interactions as "the quantification of both

changing situational factors and temporally related child responses within the context of direct observational assessment in natural settings" (p. 2).

As successful small-scale behavioral interventions have increased, a broader scope of research has developed which calls for more massive and comprehensive attention to the total environment and for more powerful manipulative control. The data, observations and relationships developed by ecologists have become a part of the research of the behavior analyst involving the interdependencies between behaviors and environments. As a result, new approaches for recording such ecobehavioral interactions are emerging in the form of observational coding systems.

Observational assessments and coding systems.

Wahler, House, and Stambaugh (1976) reported that ecobehavioral assessments must be specific to the setting in which they are observed. They listed the three facets of an ecobehavioral assessment as 1) the interview format; 2) the observational procedure; and 3) the standardized categorical coding system. Thus, the value of any assessment tool is its applicability for planning and evaluating a treatment program. The development and utilization of the observational codes and/or various coding systems have unlocked a whole new dimension for examining the organism-behavior-environment system. Such observations and code evaluations in environmental research have demonstrated the importance of environmental arrangements in the classroom setting (LeLaurin, 1984).

Developers and examiners using research reports, environmental observations, and coding systems in the academic setting include Carta, Greenwood, Arreaga-Mayer, Schulte, Terry, and Hughes (1987); Carta, Greenwood and Atwater (1985); Cobb (1971, 1972), Cobb and Hops (1971), Greenwood, Stokes, and Hops (1974), Kubany and Sloggett (1973), Stanley and Greenwood (1981) and Wahler et al. (1976). Unlike most observational codes, Kubany and Sloggett (1973) developed an observational technique where the classroom teacher, not an outside observer, could reliably estimate the percent of time students were engaged in appropriate or inappropriate behavior, without deviating from the regular classroom routine. In most experiments examining the frequency of deviant behavior(s) in the classroom, the record keeper has typically been an outside observer. Kubany and Sloggett (1973) focused on an easily learned observing and recording procedure which could be utilized by the regular classroom teacher without help or monitoring from an outside person. The code sheet included a three column coding system set up to record student behavior on either a four-, eight-, or sixteen-minute variable-interval schedule. Whatever numbered minute schedule was to be used, a kitchen timer was set for that number of minutes repeatedly throughout the day or recording period. When the timer rang, the teacher observed the target student to determine what behavior was being emitted at that instance, whether it be: 1) on-task (A); 2) passive (P); or 3) disruptive (D). The teacher entered the appropriate code symbol of "A", "P", or "D" in the space next to the number representing the time interval just passed. By using this teacher recorded coding system, baseline levels could be

estimated, the effectiveness of various treatment procedures could be assessed, and reversals and follow-ups could be monitored by the classroom teacher.

Stanley and Greenwood (1981) examined ecobehavioral interactions by means of a classroom observation system which recorded interactions of the instructional ecology. This observation system is called "CISSAR" which stand for Code for Instructional Stucture and Student Academic Response. CISSAR is a means of applying an ecobehavioral interaction approach to the assessment of ongoing classroom instruction (Greenwood, Delquadri, Stanley, Terry & Hall, 1985). CISSAR quantifies ecobehavioral interactions by recording the antecedent variables within the instructional contexts of (1) activity, task, and structure, (2) teacher position and behavior, and (3) student response; whether it be academic, task management or inappropriate (Greenwood, Delquadri, & Hall, 1984). Others who have used a modified version or an adaptation of the CISSAR code include Carta, Greenwood, Arreaga-Mayer et al., 1987 (assessment of mainstreaming special education environments); Carta, Greenwood, and Atwater, 1985 (assessment of preschool environments); Kohler, 1984 (assessment of specific social interactions); and Rotholz, Whorton, Schulte, Walker, McGrale, Norris, and Greenwood, 1985 (assessment of special education environments). Observational assessment and coding systems are providing clearer insights into the interactions between classroom and instructional variables.

The overall benefits of the ecobehavioral approach is the automatic push into a cooperative effort in which both the behavior analysts (the McCoys) and the ecological psychologists (the Hatfields) are currently engaged. Another benefit is the ability to analyze the components of organism-behavior-environment-instructional interactions which maximally contribute to increased academic responding and achievement in the classroom setting.

Academic Achievement Through Increased "Opportunity To Respond"

Once the teachers' concern for disruptive classroom behaviors have been brought under control, the next step is to increase the amount of learning that goes on in the absence of disruptive classroom behavior. Other descriptors and terminology of academic achievement are academic gains, opportunity to learn, academic engaged time, and opportunity to respond. Greenwood et al. (1984) defined opportunity to respond as "the interaction between: (a) teacher formulated instructional antecedent stimuli, and (b) their success in establishing the academic responding desired or implied by the materials" (p. 64). Academic engaged time is the combination of content covered or "opportunity to learn" and student attention or engaged time (Rosenshine, 1978). Rosenshine and Berliner (1978) stressed that time allocated to subject area is different than the time a student is actively engaged in academics, and that "student time spent engaged in relevant content appears to be an essential variable for which there is no substitute" (p. 12).

Traditionally, in attempts to provide quality education to all students, the main emphasis has been on improvement of teacher

behavior and instructional presentation, but now, the focus is on improving achievement and cognitive gains (Rosenshine, 1978; Greenwood, Schulte et al., 1985). Once disruptive classroom behaviors can be managed effectively, then the instructional time needs to be more productive. With recent improvements in design methodology and in observational systems, researchers are beginning to establish clear relationships between classroom ecological variables such as teacher behaviors, instructions and commands, materials and tasks, and direct student outcomes such as improved academic achievement and behavior.

Research on academic achievement. It is a well known fact that a child can be well-behaved in class yet not be academically engaged in the instructional program, thus achievement and learning are not realized (Greenwood et al., 1984). There is a definite need for ecobehavioral methods of analyzing the interactions that occur in the classroom setting as well as a need for methods for recording the actual effects on the learner(s) involved (Arreaga-Mayer & Greenwood, 1986). The internal life of the classroom setting of schools appears to be very important. Mehan (1978) stated that "constitutive analysis of the classroom reminds us that the classroom can be viewed as a small society or community" (p. 48). Hartman and Wood (1982) supported the notion that assumptions of environmental causality can aid in treatment and policy decisions.

In increasing the opportunity to respond and attending behavior, authors have reported significant positive correlations between the amount of time students were engaged in making active academic responses and their scores on standardized achievement tests (Delquadri, Greenwood, Stretton, & Hall, 1983). Traditionally, achievement outcomes have been attributed to teaching, however, other important correlates of achievement gains are the opportunity to learn and student academic engaged time. Ecobehaviorists emphasize the need to focus more on context and behavioral treatment variables to effect changes in outcome variables.

A group of researchers at the Juniper Gardens Children's Project, a research affiliated unit of the University of Kansas, have reported a series of studies that utilized an ecobehavioral approach to 1) identify instructional arrangements that increased opportunity to respond; 2) to establish causal relationships between student academic responding and achievement gains; and 3) to determine academic performance. A sample of these studies which examined increased opportunities to respond were Delquadri et al., (1983), Greenwood, Delquadri et al. (1984), Greenwood, Dinwiddie, Terry, Wade, Stanley, Thibadeau, and Delquadri (1984), and Hall, Delquadri, Greenwood, and Thurston (1982). For example, in one of three experiments, Greenwood, Dinwiddie, et al. (1984) conducted procedures in three all black inner-city classrooms to compare the effects of teacher mediated instruction and peer mediated instruction as it relates to academic student responding. Context and behavior treatment variables were measured by the CISSAR observation system and results indicated that classwide peer tutoring (compared to the teacher's procedure) produced higher weekly test scores and more student academic responding regardless

of subject matter content or order of treatment. In addition, Delquadri et al. (1983) assessed the effects of classwide peer tutoring on weekly spelling test scores in a third grade classroom. The classroom consisted of eighteen "average" students and six "learning disabled" children. The use of a classwide peer tutoring spelling game was designed to increase the accuracy on weekly spelling tests by increasing the "opportunity to respond" for each student. A reversal design was utilized and components of team competition, token and social reinforcement, distributed practice, error correction and peer tutoring were used to demonstrate the effects of the peer tutoring game on the entire class as well as on the six "learning disabled" children. Replication of the treatment effects was evident for both groups. Thus, increased opportunities to respond resulted in greater, more accurate academic performance, and a decrease in inappropriate behaviors. Student attention and content covered (opportunity to learn) have shown the most consistent and highest correlations with achievement gains. As Rosenshine (1978) asserted, "student time spent engaged in relevant content appears to be essential for achievement" (p. 20).

In investigating the use of peer tutoring, researchers have demonstrated that: (1) academic responding can be contextually controlled, (2) that the arrangement of this control via an instructional design like peer tutoring or tutoring instruction is of great importance to the educational gains of children, (3) and that increased "opportunity to respond" is one causal component of academic achievement (Greenwood, Arreaga-Mayer, & Clark-Preston, 1985). Peer tutoring in the classroom seems to eliminate disruptive classroom behaviors because the demand for responses are so great that there seems to be little time for anything other than responding.

Research on classwide peer tutoring and basic tutoring procedures have produced more academic responding, increased academic gains, and decreased inappropriate classroom behavior (e.g., Carta, Greenwood, Dinwiddie, Kohler, & Delquadri, 1985; Delquadri et al., 1983; Dineen, Clark, & Risley, 1977; Greer & Polirstok, 1982; Harris & Sherman 1973b; Parson & Heward, 1979; Trovato & Bucher, 1980). Robertson et al. (1976) used both peer and college tutors as reinforcement in a token economy. Johnson and Bailey (1974) found that trained fifth-grade students could effectively teach basic math skills to kindergarteners in their cross-age tutoring investigation. Five fifth-grade students tutored five kindergarten children in math skills. Further analysis of specific math skills showed improvement only when tutoring for that skill was employed. Harris and Sherman (1973b) reported that for experimental fourth and fifth grade classrooms, during their daily math assignment consisting of two pages of arithmetic problems, unstructured peer-tutoring was effective in increasing math performance. Results reported during the various conditions of: (a) peer tutoring with same problems; (b) independent study with same problems; and (c) peer tutoring with related problems, showed improved math performance observed in the math sessions preceeded by a fifteen minute tutoring period regardless of whether the tutoring was with the same problems or different-but-related problems. All tutoring resulted in better math performance than did the

independent study condition with the same problems. In addition, tutoring in combination with consequences for academic performance produced larger accuracy differences between tutored and independent math sessions. There seems to be a direct correlation; when academic engaged time is high, achievement is high (Rosenshine & Berliner, 1978).

Greenwood, Delquadri et al., (1984) noted that "achievement gain was related to increased academic practice" (p. 80). They also found that lower performing students realized larger gains in achievement during tutoring instruction. Different instructional procedures can yield varying behaviors from students, thus research has focused directly on increasing academic behaviors such as correct answers (Birnbrauer et al., 1965; Chadwick & Day, 1970), and grades (Wolf et al., 1968). Greenwood, Dinwiddie, Bailey, Carta, Dorsey, Kohler, Nelson, Rotholz, and Schulte (1985), investigated the longitudinal effects of spelling achievement to assess long-term achievement gains. Two hundred elementary aged students from four inner-city schools served as subjects during their first and second grade years. The results of this longitudinal study revealed that high levels of academic achievement and performance could be maintained over a span of two years. This study supported other findings; (1) peer tutoring is more cost effective, and (2) compared to standard teacher instruction, classwide peer tutoring is highly dynamic, with rapid responses, accelerated task presentations, and immediate error correction; all of which resulted in better spelling achievement. These and other authors have demonstrated that by increasing "opportunity to respond" maximizing student academic responding, increased students' achievement gains and overall academic performance could be obtained.

Summary And Conclusions

This review of the literature revealed specific basic findings which seem most effective in occasioning the greatest academic gains for students, and decreasing disruptive classroom behaviors. Some findings which showed positive correlations to achievement included classrooms which: 1) were teacher directed, orderly structured, and focused on academic achievement; 2) had frequent adult supervision and monitoring of students' engaged time; 3) had an achievement stressed environment which was convivial, cooperative, and democratic; 4) utilized drill with adult or peer feedback; 5) required a frequency of single factually answered questions; 6) made use of questioning procedures in which the teacher called for a group response rather than an individual student response; and 7) utilized controlled recitation practice. In summary, this review of the literature demonstrated that instructional antecedents should be arranged and controlled in order to maximize the amount of active academic responding and thus effect greater achievement gains.

Ecological stimuli within the environment are directly linked to the performance or behaviors of persons in their environments. The direct assessment of environments through the use of observational codes is offering a new look at both the frequency and quality of interactions. Thus, the enhanced ability to generate and explain behavioral differences in academic performance in the

natural environment is a definite benefit of "ecobehavioral analysis" (Greenwood, Delquadri et al., 1985). Epling and Pierce (1983) suggested that as a result of a cooperative effort, educators who examine causes of behavior can now design school programs which will result in the decline of deviant and/or aggressive behaviors while at the same time increase academic achievement. With the technology from both fields, behavior analysis and ecological psychology, a carefully controlled environment can be developed and designed to provide the maximum amount of academic responding and accelerated achievement and simultaneously minimize disruptive classroom behaviors.

Implications For Future Research

Greenwood, Delquadri et al., (1984) noted that "the implication of an ecobehavioral approach to instruction is the ability to analyze the components of instruction that contribute maximally to increasing rate and duration of academic responding in the classroom during particular sessions, and ultimately, over the entire school day" (p. 59). What is still greatly needed is the research and discovery of functional variables with respect to student academic performance and gains, and the development of an instructional technology based upon these basic principles. There is also a need for continued development and research of procedures which consider the ecological systems and antecedent components involved in instructional achievement and control, along with more descriptive investigations of classroom ecological factors which directly relate to higher academic gains. Further research is needed to identify procedures that maximize student academic behavior and that can be systematically implemented by the classroom. In addition, there is a need to continue to make use of previously developed educational technology through instructional packages which incorporate procedures designed to increase levels of opportunity to respond (Delquadri et al., 1983). Additional investigations are needed in ecobehavioral and developmental research to examine the components of the classroom environment, to determine the degrees of similarities and differences within and across various developmental domains, and to gain a better understanding of both environmental and behavioral variables which occasion the greatest academic outcomes.

Status Of The "Feud"

How have the "Hatfields" (the ecological psychologists) and the "McCoys" (the behavior analysts) fared through all of this? Well, as Willems (1974) stated, "the ecologist and the behavior modifier work differently, they work with different objectives, they tend to use their data differently, but they have much to offer each other" (p. 23). He added that setting-behavior linkages take into consideration how particular behavioral and educational outcomes in a classroom evolve as combined functions of activity format, furniture placement, and the delivery of interpersonal reinforcers and punishers. The cooperative effort by each discipline will only enhance our understanding of environment-behavior interactions and have a significant impact on program design, assessment, treatment and evaluation. There are many old problems as well as new problems

to solve, and there is so much more to discover together!

Is the "feud" over? To provide a definite yes or no answer, some of the following questions must be examined more closely, and answers or solutions to these and other issues must be resolved:

1) Have behaviorists used ecological procedures but called them behavioral?

2) Are there problems in the environment which ecologists address that behaviorists do not?

3) Are there aspects of both camps' views which are more cost effective, therefore, more practical in the classroom setting?

4) Are some of the behaviorists' techniques hard to maintain?

5) Could behaviorists actually be manipulating environmental factors but not reporting them as such?

For this or any other feud to end, a compromise must be met on both sides. This would require acceptance of all or some of one another's work, procedures, views on research, etc., and there must be a willingness to embrace those similarities and even utilize them in research and program development. This is beginning to happen. So, is the "feud" finally over? Only time holds the answer to this question, but there is a current state of cease-fire in effect, and it is hoped that this undeclared truce will last as long, if not longer than the "feud" itself.

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CHAPTER IV

SECOND LANGUAGE INSTRUCTION AND LEARNING: ECOBEHAVIORAL IMPLICATIONS

DENNIS L. MADRID

Abstract

The literature in second language instruction and learning is based largely on traditional approaches and theories of native language acquisition. The present paper highlights the inappropriateness of developing methods in second language teaching and learning founded on current approaches. As an alternative, an ecobehavioral perspective to second language instruction is offered. This approach assesses the ecological and instructional process variables in relation to student outcome measures.

Introduction

From a broad perspective, it appears that a logical consequence of the development of theories is the transformation of those theories into a technological understanding and quest for application called methods. This understanding and quest for methods stimulates experiments to test the range of pragmatic possibilities. This would seem to occur across a wide variety of fields such as psychology, medicine, physics and education. Theory and method construction are dual aspects of a process called the scientific method, to be interpreted in its broadest sense, so that comprehension of the former presupposes a comprehension of the latter. Thus, the formulation of a theory and method may be considered to be critical factors of the scientific method based upon a delicate coordination of all elements of the scientific process.

Some authors make distinctions between theories. It is suggested that one classification of theories is vaguely stated and is far removed from operationalization (Achenbach, 1978). That is, these theories have a low probability value and involve hypotheses which are not directly testable. Indeed, these theories may involve hypotheses which are unverifiable. Skinner (1957) viewed theory development in different terms. He defined a theory as "any explanation of an observed fact which appeals to events taking place in experience and measured in different dimensions." For Skinner, it appears that a critical aspect in theory construction rests on assuming that a set of explanatory statements is identical with a set of observed conditions or events. This is largely an issue of correspondence and can be answered only by finding an experimental operation which corresponds to each theoretical statement and/or condition. The difficulty of this analysis is largely a function of the abstractness of the hypothesis or statement.

Historically, with regard to theories in language learning and teaching, and in particular, second language learning and teaching, it appears that we have not had any theories or methods which could

be seriously considered for their power in offering an adequate approach for second language learning and instruction. It seems that there has been a mixed bag of mechanisms, strategies and techniques in which each may be playing a role.

Some authors may suggest that theories and a clear methodology in second language instruction are unimportant since statistically they seem to account for only about 20 percent of the variance for success in second language learning (Hammerly, 1982). What should be kept in mind is that most of the other factors associated with success in second language learning (e.g., I.Q., language aptitude, and grades in other subject areas), are difficult to define and control (Pimsleur, 1980). Of all contributing factors, theory and methodology development appear to be very important and can most readily be changed to effect success in second language learning.

There may be others who downgrade the importance of theories and methods because particular methodological studies have shown little or no difference in the results obtained with different methods (Smith, 1967). To this it can be said that most methodological experiments have suffered from serious defects. For instance, poor research may be due to the fact that many teachers do not adhere to the procedures and techniques they are supposed to use in the experiment (Mclaughlin, 1978). Furthermore, other methodological studies have shown marked differences in the results obtained with different methods (Hammerly, 1965; Johnson, 1983). So the conclusion that theory and methodology are important factors appears to be justified.

An Alternative to Structuralism and Transformationalism: Ecobehaviorism

It seems clear from the literature that neither structuralism nor transformationalism offers a powerful foundation for second language instruction. The radical behavioral-structuralists have emphasized molecular stimulus-response bonds. This has led to a form of second language teaching which emphasized very small aspects of the total environment. The emphasis is on repetition, and very little concern is given to more broad ecological variables which may be affecting student academic responding, (Stanley and Greenwood, 1981). It has been equally ineffective to take the opposite extreme, the transformationalist view, and state that imitation, practice, reinforcement, and generalization are not valid concepts in second language teaching (Jakobovits, 1970). Chomsky (1966) has stated that once a language is known, it seems clear that it is used in a largely "stimulus free and innovative" manner. It appears that the extreme behaviorist position and the extreme transformationalist position are conducive to neither fluent nor accurate performance. What is needed is an ecobehavioral analysis for second language instruction.

An ecobehavioral analysis focuses on the relation of behavior and environment. The ecobehavioral view emphasizes several points: (a) a focus on both description and intervention of the relationship between behavioral and environmental variables; (b) a focus on molar patterns of behavior; (c) a definition of behavior stated in terms of a sequence of behavioral events within the naturally flowing

stream of behavior; and (d) a broad description of the ecological stimuli as they are related to the target behavior.

The advantage which an ecobehavioral view offers for second language learning over radical behaviorism and transformationalism is that ecobehaviorism gives a powerful analysis for increasing the range of strategies for intervention and to improve existing teaching methods. In addition, a data-based analysis of ecological variables may be used to show how setting events inhibit or facilitate the learning process in the second language classroom (Rogers-Warren, 1984). Ecobehavioral methods can be used in a variety of settings for a variety of behavioral engineering purposes.

In the following section of the present paper, the ecobehavioral implications for second language instruction will be discussed within the context of structuralist-transformationalist inadequacies for second language instruction and learning.

Inadequacies Of Structuralism And Transformationalism And The Ecobehavioral Implications For Second Language Instruction And Learning.

Stevik (1971) has stated that structuralism and transformationalism have a number of common points. Both recognize similarities and differences between languages; both agree that the behavior of the language user should be the source of the data; and both agree that the second language learner should be able to produce accurately and unhesitatingly an infinite number of sentences.

A significant contribution for the present paper, lies in the inadequacies of traditional behaviorism and transformationalism for second language instruction, for it is at that point that we find some interesting implications and applications for ecobehavioral theory. Some of these issues will be discussed.

Is language conditioned? Radical behaviorists, including Skinner, have taken the view that because cognitive processes cannot be observed they cannot be used to attempt to explain language learning and instruction. The result is that behaviorists view language learning and instruction as a conditioning process. The transformationalists including Chomsky, go to the opposite extreme and see no need for the concept of conditioning in language instruction in second language classrooms, where conditioning procedures are very useful. It appears that there is a range between these two extremes. It seems that when structuralists define language learning and teaching as a system of habits they emphasize only one aspect of the total instructional environment to the exclusion of other environmental factors. Transformationalists are equally misled in rejecting the notion of habit because they tend to emphasize cognitive variables. It would seem that transformationalists could find nothing wrong in the notion that once a response has been used, it is easier to use it again, and once it has been used a number of times it becomes automatic.

The instructional implications of extreme Structuralism and extreme transformationalism have been negative, shifting from excessive dependence on molecular patterns of environmental engineering in the former case, to rejection of practice and drill in the latter case. From an ecobehavioral perspective, it would appear that for teaching a second language, several applications would be very useful: (a) the teacher should evaluate the classroom setting in which the target behaviors will be learned to identify barriers to learning and support variables for learning; (b) the teacher should gather baseline data to be used to identify ecobehavioral interactions and the effectiveness of present instructional approaches; and (c) the teacher should develop and assess strategies for generalization and maintenance of new academic responses.

Is language learning a process of discovery or generation?. Structuralists and transformationalists proceed quite differently in their analysis of language learning. In the former case, emphasis is given to a succession which runs from phonetics, morphology, syntax, semantics and discourse. Transformationalists move from discourse to semantics, sentences, lexicon, and transformations. It is important to note that the opposite orders of analysis correspond to the orders of discovery and generation, respectively. These are important differences for ecobehavioral theory because the appropriate model needs to be used in the second language classroom. It appears that the second language learner finds himself in the position of language discovery which resembles the order of structural analysis of an unknown language rather than the order the transformationalist uses in analyzing a language thoroughly familiar to him. In learning a second language, one discovers it, beginning with concrete sounds and ending with syntactic and semantic constructions.

Competence or performance: Which should be emphasized in the classroom? Linguistic competence is the unconscious knowledge of a language that an ideal speaker has. It allows the individual to understand new sentences, reject ungrammatical ones and ignore performance errors. Performance is what speakers actually say. It should be pointed out that both of these concepts refer to the speaker and make no reference to instruction. Since the transformationalists prefer to emphasize cognitive functioning, they have developed a theory of competence and not of performance. Such a theory is very abstract and complex and is based on introspection, as opposed to theories of performance which are based on observation of behaviors.

From the view of ecobehavior theory, the transformationalist's tendency to view competence as the all-important factor and to downgrade performance as trivial is very unfortunate. In a second language learning program, it is linguistic behavior that must be emphasized otherwise the result is language students who may know all the rules of language but cannot speak or perform. It makes little sense to talk about teaching a second language for competence since competence is the "unconscious" knowledge of the "ideal speaker."

Can second language learning be called creative? According to transformationalists, language behavior is characterized by creativity. The problem with this notion is that there is seldom originality in speech. There is nothing original in recombining previously memorized words and phrases. Much of what is said is based on learned sequences of words and their modifications (Hakuta, 1974). The ecobehavioral implication is that since native language acquirers and users make use of a considerable number of words and phrases, associated with particular environments, this lends theoretical support to the practice of teaching words and sentence patterns and doing drills which are necessary for habit formation.

Is there such a ghost as a "deep structure"? Transformationalists make a distinction between "deep structure" and "surface structure." As proof of the existence of these structures it is interesting to note that the transformationalists insist on dealing with ambiguous sentences. The problem seems to be that except for intentional ambiguities, they seldom occur in everyday speech. Some classic examples are "The students are revolting," or "The shooting of the hunters." These phrases lose their ambiguity when placed within the context of the discourse. From an ecobehavioral perspective, it seems that second language students are quite aware of meaning and seldom need to refer to deep structure rules since surface ambiguity disappears when attention is paid to discourse constraints and meaning (Bloom, 1970).

Is there such an animal as an ideal native speaker? Unlike structuralists, who determine what people actually say by observation, transformationalists produce grammars of the "ideal native speaker" by introspection and intuition. The ideal native speaker refers to the utterances of some mythical individual whose utterances lack hesitations, stammering, incomplete sentences and errors in grammar. The problem with reliance on this type of "data" is that it is easy to lose scientific objectivity and produce a distorted analysis. The idealization of the native speaker without reference to age, sex, socioeconomic status, culture and discourse context makes the notion of the ideal native speaker no more than that of a myth (Di Pietro, 1978).

In terms of ecobehavioral theory, instruction in grammar should refer to the speech of real native speakers and not be based on some ideal myth. They should be based on systematic observation and not on introspection. It seems clear that a transformationalist grammar is generally too abstract to be applicable to second language teaching.

A molar view versus a molecular view. While structuralists separate language rules and elements into several levels, transformationalists deal with the whole language in a global, integrated manner. The view is that language learning is a process of implicit theory construction in which language learners develop hypotheses about the rules governing the linguistic structure of the sentences they hear, test those hypotheses against new evidence they learn, and eliminate those hypotheses that are contrary to the new evidence (Katz, 1966). This view can have a very negative effect on second language instruction if it is interpreted to mean that a

second language should be learned globally, without dealing with selected parameters, one at a time. The basic pedagogical principles of shaping and reinforcement for successive approximations cannot be abandoned with impunity. The result of abandoning them is that nothing is learned thoroughly.

It would seem useful, in a second language class, to deal with one parameter of language to the temporary exclusion of other parameters. In addition, the language universals proposed by transformationalists, being so broad in nature, are of no interest to the ecobehaviorist, whose concern is with the features of the two languages, the characteristics of the learner and the ecological factors within which the target language is to be learned.

Other practical implications. To conclude this list of inadequacies of structuralism and transformationalism, we will consider the applications to the second language classroom and ecobehavioral theory. It has been said that structuralism can aid second language teaching only in the area of pronunciation and of drills. It is true that structuralists have developed a good number of types of pronunciation drills. It is also true that for the teaching of grammar, some structuralists made extensive use of simple grammar drills (Politzer, 1971). By way of contrast, transformationalists have not contributed to second language instruction a single useful type of teaching strategy or exercise (Hammerly, 1982). The claim that transformationalism would develop high level transformation exercises has not materialized (Hammerly, 1982). The inapplicability of transformationalism to second language teaching is a result of the former's concern with the unconscious mental activity of the ideal native speaker and of its disregard for performance as superficial and trivial. Such a concern for mentalism
is quite unrelated to the concerns of ecobehavioral theory.

Defining Second Language Learning

Second language learning has been defined by Hammerly (1982) as a "relatively permanent change in second language behavior resulting from instruction". Second language learning is controlled by the classroom environment with the term "environment" taking on a very broad definition. Second language learning involves at least the following factors: (a) Relevant characteristics of the learner, (e.g., age, grade level, I.Q., and study habits); (b) the motivational variables introduced into the instructional system, (e.g., praise, primary reinforcers, or recognition from classmates); (c) characteristics of the academic task, (e.g., subject matter to be learned, organization of the material, level of difficulty of the material, and time allowed for interaction with the material in the classroom); (d) characteristics of the teacher such as position in relation to the class seating arrangement; and (e) methods used for instruction such as lecture, blackboard exercise, repetition and classwide peer-tutoring (Greenwood, Delquadri & Hall, 1984).

Models of Second Language Learning

With regard to the second language classroom, there have been two widely divergent positions suggesting how a second language should be taught. At one extreme it has been asserted that no linguistic structures are innate and that language is learned entirely through experience. Children are virtual "tabulae rasae". This position goes on to suggest that language learning proceeds by general learning principles which are assumed to be the same in many species of organisms. This view has been termed the behavioral-structuralist position.

A different position is the rationalist or transformationalist view. The structure of language is believed to be pre-programmed biologically. The function of experience is not so much to teach directly but to stimulate an innate capacity. Chomsky (1968) suggests that this process results in linguistic competence. There are at least two important differences between these positions: (a) The empiricist view asserts that very little mental structure is innate, while the rationalist view asserts that a great deal is specified, biologically. This difference in emphasis is of a very large degree; and (b) the empiricists hold that the human child has no special ability for language, only a general ability to learn. Rationalists are adamant that there is a specific and strong capacity for language.

By their definition, the structuralist and transformationalist positions suggest particular teaching approaches. The transformationalist approach suggests that young children show an innate sensitivity to and keen discrimination abilities for the sound of speech. Vocalizations follow a similar universal developmental path which is relatively independent of the linguistic community. For language to develop, transformationalists assert that little is needed in terms of direct instruction. They argue that classrooms should be structured such that children are able to take advantage of the richness and variety of language as innate tendencies unfold (Dale, 1976). The implication is that children's learning ability comes to school with the child, and materials encountered in school are important only for further learning. It is suggested that no attempts should be made to directly (Dulay & Burt, 1974), teach grammatical structures. The behavioral-structuralist approach asserts that the young child's environment provides models for imitation, practice and reinforcement (Dale, 1976). The response of other individuals has a direct effect on the direction of language development. Instruction techniques emphasize a series of systematically organized oral drills which focus in on particular grammatical relationships.

Current instruction practices in second language classrooms appear to flow from some combination of the above two views. That is, behavioral-structuralists view second language as similar to first language learning in that language learning is an empirical and inductive process in which conditioned sets of habits are learned. Similarly, transformationalists view second language learning as similar to first language learning in that language learning is a rational and deductive process in which language is

acquired according to specific rules and genetic predispositions. The problem seems to be that there remains a wide variance in the rate of learning and level of proficiency in second language programs. The current theories and instructional practices focus on one of two areas to account for the prevailing large variances: (a) The transformationalists look primarily to the "inside" of the child and ignore critical external factors that have their origin in the classroom ecology; and (b) the behavioral-structuralists identify certain deficits in the environment but fail to take into consideration the interaction of the instructional environment and the child's behavior as a factor that accounts for large variances in second language learning.

Based on the previously discussed theoretical views of structuralism and transformationalism, a variety of models of second language learning have been proposed in recent years. Selinker and Lamendella's (1978) Interlanguage Model presents learner language as a system or series of systems between the native language and the second language and sharing characteristics of both. By interlanguage is meant a separate linguistic system that results from the learner's attempted production of the target language norm. Selinker (1972) argued that interlanguage resulted from four central processes involved in second language learning: (a) Language transfer may result in some rules or characteristics from the first language; (b) some elements of the interlanguage may result from transfer of training; (c) some elements of the interlanguage may result from particular strategies of learning the second language; and (d) some elements of the interlanguage may be the result of overgeneralization of features of the target language. In each case, the process brings about "fossilization" in that linguistic items, rules and subsystems in the interlanguage are retained, no matter what the age of the learner or the amount of instruction and explanation received. Unfortunately this model does not distinguish between acquisition and learning and does not give any details about the relationship between the two languages and the second language learning process.

Dulay and Burt (1974) have proposed a construction hypothesis which posits the development of the second language independently of the native language. That is, children structure the language they hear and create rules of their own guided by specific innate mechanisms. The main thrust of this position is that it is not enough to consider simply the complexity of syntactic structures in linguistic description. Analysis in terms of complexity ignores the possibility that the child, in acquiring a language, organizes linguistic data in accord with certain cognitive strategies. Though their analysis was tentative, Dulay and Burt hoped that analysis in terms of distinctive features of structures would provide clues about the actual strategies learners use in acquiring second languages. These strategies may be universal, but not enough is known about learning hierarchies in second languages other than English to postulate specific universal language-learning strategies. The problem with this hypothesis is that it is based on a questionable concept of a natural sequence of acquisition. In addition, there is evidence to suggest that the native language does indeed influence second language learning, although not to the point

of being the sole factor responsible for the development of the second language (Madrid and Torres, in press).

Schumann (1976) suggested that there are certain similarities between second language learner's interlanguages and pidgins. Pidgins are a simplified form of language in which elements of the native and second language are used in communication. He has proposed a Pidginization Hypothesis of second language learning. He proposed that this strategy is used by both first and second language learners. Both types of learner will tend to prefer simple to more complex constructions, will drop word endings and so forth. The problem is that although a process of simplification and reduction may occur in second language acquisition, there is no evidence that this process occurs in the second language learning situation unless unrestricted and uncorrected communication is allowed to proceed from the very beginning of instruction.

An Alternative Approach

While an ecobehavioral approach to differences in student academic development is not new (Bijou, 1981), assessment measures that provide an analysis of the interaction between instruction and student behavior present a new approach (Greenwood, Delquadri, & Hall, 1984). An ecobehavioral assessment of instruction looks at both classroom variables (tasks, teacher behavior, class grouping, etc.) and student behaviors (Stanley and Greenwood, 1981). Since these variables are systematically observed and recorded, the nature of the interaction is captured (Greenwood, Delquadri, & Hall, 1984). Past outcome research has failed to provide us with critical interaction measures, therefore we have not been able to make statements about student outcomes related to second language program instruction (Strain & Kerr, 1981).

An ecobehavioral perspective has been defined in a variety of ways. Barker (1968) has focused on the interdependence of the organism and the environment in specific behavior settings. Brophy (1979) emphasized the transactions that take place between separate but identifiable behavior systems within a larger environment. Although each of these perspectives may lead to different goals, the common denominator seems to be a concern for the dynamic interaction between behavior and environment.

An ecobehavioral assessment involves sampling ecological and behavioral variables in close contiguity and systematically examining both ecological and behavioral variables (Greenwood, 1985). By alternating ecological and behavioral variables, the contextual basis for student behavior is established for quantitative analysis. An ecobehavioral analysis may prove to be beneficial for second language instruction for a number of different reasons: (a) It leads to the development of a data base on the interaction of student behavior and the setting in which the target response is to occur; (b) the development of indices of base rates and base probabilities of ecobehavioral variables in relation to particular instructional practices; (c) identification of ecological arrangements correlated with certain high levels of criterion behaviors; and (d) identification and analysis of factors

which interfere with instruction or facilitate maintenance of it.

Ecobehavioral theory offers the possibility of developing precision teaching strategies that will be effective in dramatically increasing the response frequency and accuracy of students acquiring academic material (Greenwood, Delquadri, & Hall, 1984). (This type of research is related to the notion of opportunity to respond being conducted at the Juniper Gardens Children's Project, a school research unit of the University of Kansas). In their continuing effort to understand behavior change, Greenwood et al., (1984) have increasingly taken an interactional or ecobehavioral view. This ecobehavioral perspective has emphasized the antecedent conditions of behavior. The implication of this approach is the ability to analyze the components of instruction that contribute maximally to increasing the rate and duration of academic responding in the classroom during particular sessions.

The research on ecobehavioral interactions by Juniper Gardens staff has focused on "opportunity to respond" (Hall, Delquadri, Greenwood, & Thurston, 1982). Opportunity to respond can be defined as the interaction between: (a) teacher formulated instructional antecedent stimuli (the materials presented, prompts, questions asked, signals to respond, etc.); and (b) their success in establishing the academic responding desired or implied by the materials. Present research focusing on academic learning time has frequently been limited to molar non-categorical definitions of behavior. Stanley and Greenwood (1981) have operationalized opportunity to respond through the development of the CISSAR observation code (Code for Instructional Structure and Student Academic Response), which has resulted in an analysis of specific academic responses and their instructional determinants. This has made it possible to describe instructional antecedents that have controlled or failed to control the desired academic responses of students. As a result one may be able to engineer instructional procedures which maximize student academic performance.

Ecobehavioral Theory & Methods: Generalization to Second Language Learning

Dubin (1978) has suggested that considerations for communicative performance in second language courses are largely undefined as to exactly what topics and issues should be included in the curriculum. Taylor (1983) has called for the development of principles and techniques which are important in the integration of real skills and practice in classroom activities within a student-oriented curriculum. Taylor (1983) heavily emphasized the need for a classroom environment which promotes communication among the students and between the instructor and the students. He proposed that at least two basic components must exist for successful second language learning in children: (a) a classroom environment in which encouragement is given for learners to practice their new acquisitions; and (b) a set of class activities which will serve to motivate students to practice both in the classroom and outside of the classroom.

In attempting to develop an approach to second language instruction based on ecobehavioral methods, Johnson (1983) examined the effects of peer tutoring on the social interaction and English language proficiency of Spanish-speaking elementary school children. The peer tutoring treatment consisted of sessions designed to provide a structured setting for natural language practice between a limited English proficient child and a fluent English speaking child, (e.g., pairs were instructed to talk aloud about their pets or favorite toys). The results suggested that peer-tutoring resulted in increased vocabulary comprehension among limited English speaking children. The study seemed to emphasize the importance of using interactions among peers as an important tool in designing English as a second language programs.

Mclaughlin (1980) has suggested that theory and research in second language learning are leading us to ask questions for which we need a new research paradigm, one that focuses on the interaction of person and environmental factors. This new paradigm has been used in some areas of research in education and psychology. For instance Greenwood, Delquadri, Stanley, Terry, and Hall, (1985) have shown that the ecology, which is characterized by particular arrangements of stimuli within that environment, is related to the performance of students within that setting. To achieve these objectives several important methodological features were emphasized: (a) students from various socioeconomic backgrounds were used; (b) a complex code was used to record the interaction of instructional arrangements and student responses for an entire school day; (c) conditional probabilities for responding were computed; and (d) an examination of the stability of the findings was carried out. That research, which is being carried out at Juniper Gardens, has focused on the following: (a) the discovery of those factors which are related to the academic performance of inner-city low achievers, and (b) the development of instructional strategies which are based upon the principles of ecobehavioral theory.

With respect to second language instruction, it is possible to develop a set of guidelines that follows the above reasoning and represents an application of the basic principles of ecobehavioral theory. The following comments represent some modifications and applications of work developed by Rogers-Warren and Warren (1977). These comments serve as suggestions to signal the importance of ecological variables in an area as different as second language instruction.

Ecobehavioral Theory: Focus on Second Language Instruction

I. Identify the target language parameters upon which instruction will focus.

A. This step should include a clear specification of the grammatical structures and various language environments in which the particular structure will occur.

B. The teacher may develop observations regarding students' present level of responding with regard to the grammatical structures of interest (pre and posttests).

II. Assessment of the physical setting.

A. It should be determined what each student in the classroom is doing that is relevant (or irrelevant) to the task at hand.

B. The critical stimuli in the classroom setting for particular topics should be identified and emphasized.

C. The discriminative stimuli for the target behavior should be identified and used as a critical part of the instructional strategy.

D. The reinforcers for successive approximations to the target behavior must be specified and incorporated into the overall instructional plan.

E. The identification of critical adults who will be present during the lesson time must be made and a determination of how the adult behavior may impact on student on-task responding.

III. Evaluate the Contingency Environment

A. The teacher must realize the importance of reinforcements for increasing or maintaining appropriate language behaviors. It may be desirable to determine the rate of correct language responding by monitoring responses during class sessions for pre and post reinforcement interventions.

B. Teachers may make use of natural reinforcers such as art time, snacks, games, etc., that are found in most classroom settings.

C. Assessment of ongoing contingencies will show the teacher how these will compete with a newly established contingency.

IV. Design a second language program based on information about the instruction setting and target objectives.

A. The children may be seated in pairs to facilitate communication in the second language.

B. To encourage verbal expression, the teacher may provide prompts in the form of statements written on paper which students may practice in dyads.

C. The teacher may walk around the room and use additional positive verbal prompts to increase child verbalizations.

D. Teachers and students may use praising and other forms of social reinforcement to maintain the on task behaviors and increase second language verbalizations.

Conclusion

Although no single proposal for a second language classroom curriculum will meet the needs of all child second language learners, the teacher is confronted with the responsibility of carefully evaluating various teaching methods which deal with particular target behaviors in particular environments. This paper has attempted to highlight some of the theoretical and pragmatic issues in second language instruction and has attempted to suggest an alternative theoretical approach which is based on observation, data collection, careful environmental engineering, and assessment of results. As such, the complete language program in second language instruction is one that identifies appropriate target areas and provides an ongoing step by step evaluation of language learning. In addition, a description of environmental events which correlate with second language learning should be identified. Maheady, Towne, Algozzine, Mercer, and Ysseldyke, (1985) have stated if educators improve the quality of instructional services which are provided to learners, then there will be dramatic gains in educational benefits for learners.

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CHAPTER V

ECOBEHAVIORAL VARIABLES AFFECTING SEVERELY HANDICAPPED CHILDREN IN INSTITUTIONS AND COMMUNITY SETTINGS: A COMPARATIVE ANALYSIS

GWENDOLYN BENSON

Abstract

A growing concern for appropriate placement of severely handicapped students has developed over the past several years. Unfortunately, many educators, politicians, and others remain unconvinced that large state institutions are not the most appropriate placement for severely handicapped students. Numerous comparisons have been made between the outcomes of placement in institutions versus community settings. However, few studies have delineated specific ecobehavioral variables that affect students in both environments. This review of the literature was designed to examine and compare ecobehavioral variables in institutions and community settings that facilitate or inhibit skill acquisition of severely handicapped students. An attempt was made to assess setting events, staff performance, appropriateness of materials and activities, and opportunities for social interactions. The significant effects and implications of each of these variables on severely handicapped students in institutions and community settings were examined.

Introduction

Traditionally, society's treatment of severely handicapped children has been one of neglect and mere custodial care. Evidence of this neglect is best demonstrated by placement options made available to this population. The options have been widened, however, as a result of past legislation (P.L. 94-142, 1975). Severely handicapped individuals are no longer restricted to institutional settings. Other educational options are currently available.

Acceptance of alternatives to institutional placement has not been fully realized by all. These alternative educational settings range from self-contained private and public schools to self-contained and regular classes plus resource room service within regular schools (Kaufman & Morro, 1978). The term, self-contained, refers to schools or classrooms that serve only students who have specific handicapping conditions. Though there may appear to be a continuum of service delivery options available, the predominant models currently in use are self-contained schools on the grounds of institutions and self-contained private and public schools (Kenowitz, Zweibel, & Edgar, 1977).

The advantages and disadvantages of educating students in least restrictive environments have been discussed by numerous researchers (Burton & Hirshoren, 1979; Sontag, Certo & Burton, 1979; Brown, Wilcox, Sontag, Vincent, Dodd & Gruenewald, 1977). Additionally, researchers have looked at the harmful effects of institutional life

on severely handicapped individuals. Silverstein (1969) investigated the longitudinal decline in IQ of persons residing in a large institution. Phillips and Balthazar (1979) documented declines in communication during prolonged institutionalization. Hee and McClennen (1981) compared the difference in school behaviors of 59 severely or profoundly retarded children and youth (6 to 18 years old) living in institutions with 29 equally retarded children living at home. Of ten behavior categories, significant differences were found in three: more institutionalized children exhibited stereotyped behavior, whereas, children living at home exhibited more appropriate communication and more appropriate other behaviors. Aames and Moen (1976) reported adaptive behavior changes in residents of community group homes who had formerly lived in institutions. Brown et al., (1977) suggested the following disadvantages of institutional settings: (1) exposure to nonhandicapped student models is absent or minimal; (2) severely handicapped students tend to learn "handicapped" skills, attitudes, and values; (3) teachers tend to strive for the resolution of handicapping problems at the expense of developing functional community-referenced skills; (4) most comparisons between students are made in relation to degree of handicap rather than to the criteria of non-handicapped performance; and (5) lack of exposure to severely handicapped students limits the probability that the skills, attitudes, and values of nonhandicapped students will become more constructive, tolerant, and appropriate.

Although the advantages of placement in the least restrictive environment have been empirically validated by various researchers, there are those who remain unconvinced. In an attempt to understand this attitude, one might look at various reasons for institutionalization of handicapped individuals. Kaufman and Morra (1978) suggested that the rationale for placing handicapped children and youth in residential schools or institutions has at various times included the following explanations: (1) a need for separation from society; (2) a need for domicile living; (3) a need for intensively supervised living and-or therapeutic medical care; (4) a need for unique treatment; and (5) a need for extreme flexibility in program scheduling. Considering this rationale, Burton and Hirshoren (1979) reported various disadvantages of integrating handicapped students into public school settings. First, they proposed that handicapped students would be open to ridicule and that neither handicapped nor nonhandicapped students would benefit because nonhandicapped children would bring to school with them many of the fears, superstitions, and prejudices of their parents, as well as some of their own. Second, these authors recommended the continuation and establishment of special class centers, similar to institutions, because of their benefits of homogenous grouping, flexibility in scheduling, the concentration of ancillary services, efficiency in the maintenance of a barrier free educational environment, and programming in an accepting environment for a population of children and adults who are handicapped. Although the conventional wisdom has held that certain handicapped individuals, especially those presenting difficult training, medical, or management challenges, should be served in congregate facilities, it has been shown that community-based programs may serve a population equally complex as that found in institutions (Menolascino, McGee & Casey, 1982).

In view of the advantages and disadvantages of institutional and public school settings for severely handicapped students, few researchers have reviewed specific ecobehavioral variables that make one setting more appropriate or less appropriate than the other. This requires going beyond the mere argument that integrated community settings are more appropriate than segregated institutional settings for the obvious normalization reasons.

Ecobehavioral variables, as discussed in this paper, refer to the interaction of various ecological and behavioral factors in the individual's immediate learning environment. The term eco-behavioral can best be defined as an area of applied behavior analysis that reflects a modified behavioral perspective on environment-behavior relationships (Rogers-Warren, 1984). This step involves identification of setting variables such as materials, curriculum, instructional procedures, physical arrangement of classrooms, behavior management procedures, staff, social interactions, and the interaction of these variables in both institutional and community settings. The major premise of the ecological model is located in the interaction between the child and the people and elements in the child's environment (Rhodes, 1967; Swap, 1974). The methodology for studying these interactions generally emphasized long term observations of the ongoing stream of behavior in natural settings (Willems & Raush, 1969) and the differential impact of settings on behavior (Gump, Schoggen, & Redd, 1963; Kounin, 1970; Buchan, Swap & Swap, 1977). The behavioral model, on the other hand, suggested that behavior is a product of the environment.

Data evaluating the community experiences of severely handicapped individuals is not often reported, and comparative data on individual persons experiencing community and-or institutional lives are even less common (Keith & Ferdinand, 1984). This void in the literature, related to ecobehavioral variables affecting severely handicapped children in institutions and community settings, may very well contribute to the opposition of some individuals to deinstitutionalization. The issue remains somewhat controversial, despite results that have proven integrated community settings are the most appropriate settings. Regardless of these issues, we continue to see new institutions under construction throughout the country. In addition, those individuals who are leaving institutional settings and undergoing integration or re-integration into the community are doing so at an extremely slow pace (Baroff, 1974). Thus, institutions will remain with us for many years to come. Therefore, if ecobehavioral variables affecting severely handicapped individuals in both institutional and public school settings can be clearly identified and substantiated, perhaps they can aid in facilitating more appropriate environmental settings in communities and institutions until the process of deinstitutionalization can be fully achieved.

This paper is an attempt to look at ecobehavioral variables in institutions and community settings and how these variables affect severely handicapped individuals. Both institutions and specific community settings will be discussed, along with ecobehavioral variables found in each setting.

Institutions

According to Baroff (1974), "institution building" began during the 19th century and has continued to the present until virtually every state has one or more such facilities. Since this time, institutions have been grossly criticized and referred to as dehumanizing and sometimes horrifying. A pictorial essay of common abuses has been offered by Blatt and Kaplan (1967) and in some states these conditions have led to judicial intervention. Concern at both the lay and professional levels has caused some to consider the typical large institution as essentially "unreformable" and has led to recommendations for their eventual replacement by much smaller types of community based facilities (Thurman & Thiele, 1973; Wolfensberger, 1969, 1971a, 1971b). Paradoxically, in spite of growing interest in smaller types of community based facilities rather than institutional programs, the number of institutions has continued to increase and during the past decade, at an accelerating pace. According to Baroff (1974), although the pace of institution building has continued unabated at least to the very recent past, the size has been considerably altered; newer facilities are much smaller in size. Facilities constructed during the 1960-65 period typically served between 40 to 1,738 individuals (Scheerenberger, 1965). Before 1960, institutions housed an average of 24 to 4,273 individuals, and it is presumed that those added after 1965 have continued to decline. Segal (1971) suggested that increased discharge rates experienced by mildly handicapped persons have contributed to the decrease. However, release of more severely handicapped persons has proven to be more difficult. This suggests that the composition of our institutional population has been changing in the direction of an increasing proportion of more severely impaired persons (Sabagh & Windle, 1960).

Several studies have indicated that prolonged and early institutionalization usually has an adverse effect on mental and emotional development (Goldfarb, 1945; Provence & Lipton, 1962; Skeels & Dye, 1939). Baroff (1974) reported that there is a much reduced lifespan in institutionalized severely and profoundly retarded persons. Data for one of North Carolina's institutions revealed that the average age of residents age 6 and above, at death was about 27 years for the severely retarded and 23 years for the profoundly retarded (North Carolina Department of Mental Health, 1972.)

In reviewing the role institutions have played as a service delivery option for severely handicapped children, it would be remiss to assume that all institutions are alike. Butterfield and Zigler (1965) argued forcefully that institutions differ in their effects on their retarded residents. There have been several attempts to identify the social-psychological factors within institutions that account for their differential effects. Bensberg and Barnett (1966) reported the most significant factors were personnel turnover, attendant working conditions, degree of modernity, cost of operation, rural versus urban settings, and availability of professional services. Silverstein (1967), on the other hand, found that four slightly different factors best explained differential effects: staffing adequacy of cottage and medical personnel; staffing adequacy of teachers, psychologists, and social workers; institution age, size,

and crowding; and resident competence. According to Tizard (1970), large institutions were found to be regimented and unstimulating while the smaller ones provided greater individualization and flexibility. The differences were in organizational structure, not in child outcomes. Klaber (1969) conducted a study of six state institutions and reported that children with equivalent mental abilities were not functioning at comparable levels of self-sufficiency and general adjustment; the institutions did differ in child outcome. From the standpoint of normalization, as elaborated by Wolfensberger (1972), it is especially interesting that the institution with the most self-sufficient and best adjusted residents was by far the smallest (only 300) and the most community-integrated (meaning the extent to which residents utilize the community for services rather than having them all provided at the institution).

If one could confidently assume that there are good institutions and bad institutions and that intelligence can be increased through training, it might seem reasonable to expect an effective institutional training program to prepare persons for community placement. Vitello, Atthowe, and Caldwell (1983) suggested a basic fallacy in this line of reasoning, indicating instead, the likelihood of a decline in functioning level over time in the institution. This observation is consistent with findings of significant skill losses among institutional residents (Keith & Lange, 1974). These authors suggested that the common wisdom that persons with severe and profound mental retardation should be served in large congregate settings is called into question. In fact, it might be argued that greater needs should dictate smaller settings in which effective training, environmental stimulation, and life style management can be ensured. Also, it would seem reasonable to conclude that environments which are more nearly normalizing can also be effective if proper programming components are present. Although it is possible for normalizing environments to preclude effective training (Throne, 1975; Keith, 1979), those studied in the present investigation combined community access and successful programming.

Community Settings

A rationale for integrating handicapped students into regular educational settings has been formulated over the past decade (Bricker, 1978; Dunn, 1968; Hartup, 1978; Wilcox & Sailor, 1980; Wolfensberger, 1972). This rationale is that more opportunities and better social models may be available in integrated settings compared to segregated institutional settings.

Empirical research substantiating the benefits of integration of mildly handicapped students has been conducted (Madden & Slavin, 1983). Unfortunately, the rationale for integration of severely handicapped students has been speculative, relying very little upon empirical research involving such students. Thus the right of access to regular school environments has been challenged.

Alternative community placements include a number of options ranging from the most to the least restrictive. These include special education day school, special education self-contained classrooms and resource rooms. For the purpose of this paper, the special education

self-contained classroom in a public school building is the placement of preference for the majority of severely handicapped students. For clarification, the special education day schools closely resemble a small scale institution with only handicapped children in attendance. However, they do offer more opportunity for interaction with normal peers by allowing the handicapped child to remain at home and in the community, few interactions with nonhandicapped peers occur in the school setting. Therefore, this is not considered the least restrictive environment in most cases.

Baroff (1974) offered the following rationale for educational placement of handicapped individuals in segregated school: (a) a need to serve large numbers of handicapped children; (b) a need for special curricula and environment; and (c) a need in many regions to form cooperative multi-district programs for both economic efficiency and instructional effectiveness. The resource room, on the other end of the continuum of alternatives, is an instructional setting which the child usually visits on a regular scheduled, part-time basis. Generally, the child spends the rest of the day with his or her regular class. This placement option is generally provided to mildly and moderately handicapped students and is not viewed as an appropriate setting for the majority of severely handicapped students.

According to Baroff (1974), the special education self-contained classroom has been the most prevalent arrangement used by public schools to provide instruction to the handicapped. The rationale includes the following: (1) a need for homogeneous grouping of handicapped children by nature and severity of the handicapping condition in order to facilitate the provision of instruction; (2) a need for flexibility in determining the appropriate level of segregation from nonhandicapped peers; (3) a need for provision of special curricula and instructional techniques for the handicapped; and (4) the need for coordinated, sequential programming. This placement option provides optimal opportunity for severely handicapped students to interact with nonhandicapped peers in a natural setting.

Numerous researchers have developed and implemented strategies for integrating severely handicapped students in normal school and community settings (Almond, Rodgers & Krug, 1979; Bricker, 1978; Hamre-Nietupski & Nietupski, 1981; Stainback & Stainback, 1981; Taylor, 1982; Thomason & Arkell, 1980). Further, current educational approaches emphasize teaching severely handicapped students practical, useful life skills in normal environments in the company of their nonhandicapped peers (Brown, Branston, Hamre-Nietupski, Pumpian, Certo & Gruenewald, 1979; Fredericks, 1980; Haring & Brown, 1979; Sailor, Wilcox & Brown, 1980; Sontag, Smith & Certo, 1977; Williams & Fox, 1977). However, ecobehavioral variables that facilite or inhibit successful programming in normal school and community settings have yet to be specifically identified.

Ecobehavioral Variables

Settings. In an attempt to identify variables that influence overall skill acquisition and social adjustment of severely handicapped students, a review of existing literature comparing institutional and

community settings will be presented.

There are very few empirical studies on the effects of institutional environments on mentally retarded individuals. Several accounts of the "austere" nature of environmental conditions in some institutions for the mentally retarded have been provided (Blatt, 1970; Blatt & Kaplan, 1967; MacAndrew & Edgerton, 1964). Studies that have attempted to compare institutionalized and non-institutionalized children generally have favored the latter (e.g., Centerwall & Centerwall, 1960; Farrell, 1956; Pasquale, Boroskin & Ross, 1971; Slobody & Scalan, 1959).

In a study conducted by Keith and Ferdinand (1984), a comparison was made between institutionalized and community based subjects. The institutionalized subjects were provided with a variety of educational and vocational training programs, and all medical, psychological, and recreational services. Subjects in the community lived in a variety of small residential settings, the largest serving seven persons, dispersed throughout the community. They were provided with vocational services by each area program, and generic community services were used for meeting more medical, psychological, and recreational needs. Results of this study showed the tendency for individuals in the community to increase in functioning level was greater than that of persons in the institution, where a greater relative frequency of decreased functioning levels was observed. Even though the institution studied had strong capabilities in staff development and programming and a sophisticated system of daily training and data collection, the trend toward increased functioning levels in the community was clearly demonstrated. Thus, while the institution might become the enriched environment argued for in Wyatt vs. Ireland (1978), the effects of institutionalization may nevertheless be detrimental. Considering the fact that many institutions have upgraded their programming, one might ask, what is it that constitutes an unfavorable environment? Though the child's physical needs might be met, it is much more difficult in large group-care settings to offer the kind of one-to-one attention that can be provided with a smaller setting (Baroff, 1974).

The physical aspects of the environment are essential to the motivation and stimulation of the students. The design, including needed equipment and supplies, should reflect a physical environment that provides optimal educational opportunities for the children, an efficient organization for staff members working in the setting, and careful attention to the health and safety needs of both children and service delivery personnel (Sailor & Guess, 1983). Twardosz, Cataldo and Risley (1974) proposed an open environment which ensured that children would not be overlooked, forgotten, or abused. An open environment is described as one without internal walls or partitions, making it possible for students and staff to remain visible at all times. This study was conducted in an infant and toddler day care facility, but also has relevance to settings for severely handicapped students.

In the past, investigators have realized that certain aspects of the physical environment can be modified to encourage specific types of behavior (Ittelson, Proshansky, & Rivlin, 1970b; Krantz &

Risley, 1972; Sommer, 1969). These studies suggest that the arrangement of the physical environment should be one of the first considerations when planning a program of providing care for dependent persons. Moore and Richard (1959), Read (1960), Robinson and Spodek (1965), emphasized a planned setting (i.e., materials and activity-specific areas purposefully arranged) but encouraged utilization of the child's natural interests and spontaneity as a guide to teacher structuring.

Focusing primarily on psychiatric settings, Moos (1974) argued that environmental factors play a more substantial role in influencing behavior than psychologist have often recognized. The design of educational environments for the severely handicapped has too commonly been left to tradition or chance and it is time that systematic relationships between environmental factors such as reactive toys, adaptive equipment, naturally occurring events, and normal peer models, and individual behavior be identified (Frederiksen & Frederiksen, 1977).

Hursh, Latimore, Reid, Mayhew, and Harris (1978) and Hursh and House (1983) have examined the effects of various arrangements of institutional day rooms on the play behavior of severely handicapped persons. However, setting events do not control behavior completely; they set the occasion for or increase the probability of certain types of behaviors (Kantor, 1959; Wahler & Fox, 1981). Horner (1980) provided an analysis of the effects of an "enriched" institutional environment (a residential setting containing a variety of toys and other materials for clients' use) on the adaptive and maladaptive behavior of female severely handicapped residents. During the environment condition students were provided with toys and objects selected according to the following criteria: (a) capable of being manipulated in some manner, (b) resistant to destruction, (c) not likely to be swallowed or poked into body orifices, (d) difficult to use as a weapon, (e) low probability of producing injury if used as a weapon, and (f) could be cleaned or discarded when soiled. Conditions in which the enriched environment was paired with contingent reinforcement for object manipulation produced the large positive changes in client behavior. Adaptive behavior averaged 5% during baseline, 33% in the enriched environment alone, 52% when the enriched environment was coupled with differential reinforcement of adaptive behavior, 36% when reinforcement was noncontingent, and 52% during follow-up. This study demonstrated that the environment must be structured so that adaptive behavior is occasioned and thus can be reinforced. Haywood and Tapp (1966) pointed out that the nature of the physical environment will largely determine the type of behavior that will occur there. Lindsley (1964) and Bensberg, Colwell, Ellis, Roos, and Watson (1969) suggested that development of new prosthetic environments are designed to allow retarded persons greater control over surroundings. Prosthetic environments include functional alternatives, adaptive equipment such as standing tables, wheelchairs, mats, corner chairs, head pointers, communication boards, levers, feeding utensils, and other alternatives that provide an opportunity for maximum independence. Additionally, adaptive materials are required to inhibit abnormal physical development and facilitate students' ability to participate more fully in various activities.

More specifically, Cleland and Swartz (1969) suggested modification of the physical environment as one of the more promising methods for facilitating institutional improvement. Gorton and Hollis (1965) described a number of architectural modifications of an institutional living unit that apparently resulted in better research and programming for severely retarded individuals residing there. Kimbrell, Kidwell, and Hallum (1967) reported anecdotally that substantial improvement in neuromuscular coordination, toileting, and eating behaviors of severely and profoundly retarded girls was accomplished by modifying the physical nature of the ward and playground.

Implications of the precedeing research suggested that institutional environments can be designed to facilitate skill acquisition of severely handicapped students. Community environments, however, offer a rich variety of natural cues and prompts, (e.g., crossing the street when the light is green, answering the telephone when someone calls, and riding the city bus to work), that rarely lend themselves to the rearrangement strategies typically used in institutional settings (Ford & Mirenda, 1984). These authors suggested that severely handicapped students must learn to respond to relevant cues and corrections in the midst of the spontaneous happenings and general variability of events that naturally occur in community environments.

In observing different settings, no two classrooms will be arranged, physically, in exactly the same way. The design will vary with the size and shape of the room, location of the room within a particular building, the needs of the children served, and importantly, the funds available for purchase of materials and equipment (Sailor & Guess, 1983). From existing research, there is no evidence of any major physical differences between institutional classrooms and community classrooms for severely handicapped students. The major differences are found in the types of materials, equipment and environmental adaptations provided.

Materials. The presence or absence, age appropriateness, functionality, and motivational characteristics of materials are all important aspects of immediate learning environments for handicapped students. Materials include manipulative objects, such as toys, books, tools for daily living skills, and other items. Also included under the materials category are adaptive equipment and various types of curriculum.

The types of toys selected for severely handicapped students have been shown to have an influence on the child's play behavior with peers and interaction with the toys. Two components considered essential in designing toy play training programs are the selection of effective training procedures and the appropriate choice of play materials or toys (Wehman, 1977; Wuerch & Voeltz, 1982). Several investigations have shown that certain types of play materials differently affect the play and social responses of nonhandicapped young children (Hendrickson, Tremblay, Strain & Shores, 1981; Quilitch & Risley, 1973). The same is true for severely handicapped young children. One class of play materials that may have facilitative

effects on eliciting play activity from severely handicapped children is reactive toys (Wehman, 1976; 1977). Reactive toys are highly responsive to a child's manipulation. More precisely, Hooper and Wambold (1978) defined reactive toys as those toys which when acted upon, temporarily sustain motion and-or produce auditory, visual, or tactile feedback. Non-reactive toys, on the other hand, are defined as having a limited potential to provide sensory feedback as a consequence of manipulation during the normal course of play and thus should be avoided with severely handicapped children. Two reactive toy dimensions, sound potential and flexibility, were shown to have a consistent and powerful effect on the duration of object manipulation by nonhandicapped infants, when compared with identical play materials that did not have the capacity to produce these reactive features (Corter & Jamieson, 1977; McCall, 1974). Results of these studies provided empirical support for the use of reactive toys for stimulating play activity of severely handicapped children.

One of the main problems observed in the past, however, in both institutional and community settings, is age inappropriateness of activities, toys, and other materials. Skills that are chronologically age appropriate and utilized by the nonhandicapped population should be selected and modifications made in them. Hamre-Nietupski, Nietupski, Sandvig and Ayers (1984) offered the following considerations for selection of activities: (1) select activities that provide individuals with enhanced sensory input; (2) select materials that minimize motor requirements for operation; and (3) consider the speed required to use the materials appropriately.

In addition to functionality and age appropriateness, using a variety of different materials is important for severely handicapped students in order to insure generalization across different materials. This will not occur if students are continuously trained with limited materials. This is an area where many institutional settings fall short. The most common observations include students participating in activities which are neither functional nor age appropriate. This is less likely to occur in regular school settings for numerous reasons: classes are, generally, more closely monitored by local education associations; better trained staff are available; and more opportunities for students to use functional skills are generally provided. The assumption should, by no means, be made that all institutional and all regular school settings are alike.

Knowledge of the significance of appropriate materials should make it possible for both institutional and community settings to insure that students are provided with such materials. Though research does not exist to support the idea of better materials in community settings, it is likely that community settings would come closer to providing more functional and age appropriate materials due to the fact that teachers in the community are closer to nonhandicapped students and are more likely to observe them and the materials they use in their daily interactions.

Student Behaviors. Attempts at providing a definition of severely and profoundly handicapped individuals have included specific behavioral or physical conditions (Sontag, Burke, & York, 1973), such as severe or complex disabilities that restrict ambulation or

locomotion by means of typical transportation modes; behavior characteristics that are injurious to self or others; hyperactivity; impulsiveness; frequently uncontrolled bowel or bladder functions; epilepsy, grossly inadequate communication skills; mixed multiple sensory motor disabilities.

There is evidence to indicate that behavior is situation-specific and very responsive to the setting events, reinforcement probabilities, and discriminative stimuli that operate in different settings (Patterson & Cobb, 1971). Behavior generalization across different settings is probably a function, in part, of the amount of stimulus similarity that exists between such settings. For example, stereotyped behaviors were found more often within institutional environments that lack opportunities, materials, and leadership for purposeful activities (Klaber & Butterfield, 1968). Some investigators proposed that stereotyped behaviors provide a means for severely handicapped children to respond to frustrating situations (Baumeister & Forehand, 1971). Other interpretations attribute stereotyped behavior to a form of self-stimulation, suggesting that children engage in these behaviors because they are not stimulated by the environment. This problem as reported in the literature is reflected in chronic resident inactivity. General idleness and a lack of purposeful activity is a persistent and widespread problem among the 200,000 institutionalized mentally retarded in this country (Blatt, 1970) and low morale (Maddox, 1963). This interpretation is supported by findings that two-thirds of institutionalized residents engage in some form of stereotyped behavior and that the longer an individual remains in an institution the more likely he or she is to develop such behavior (Berkson & Davenport, 1962). Kreger (1971) suggested that overcrowded and sensorily deprived environments in most institutions account for much more of the bizarre and disturbed behavior exhibited by many institutionalized persons.

With reference to the degree of structure in activities and presence or absence of staff, it will come as no surprise to anyone familiar with institutionalized programs for severely profoundly retarded persons that about half of the resident's time is spent doing nothing at all or engaging in stereotyped kinds of behavior (Klaber & Butterfield, 1968). Even in the most effective institutions, nearly 14 percent of the residents' time involved stereotyped or autistic like activity. Klaber and Butterfield (1968) were referring to rocking, hand-waving, head-banging, and other complex behaviors seen in severely and profoundly retarded persons and in autistic children.

In further investigation of various behaviors exhibited by handicapped students, an ecological approach was used to examine the effects of placing emotionally disturbed preschool children concurrently in two classroom settings; a special class and a regular class (Brinker & Thorpe, 1984b). The effects of environmental variables such as the degree of structure in activities and the presence or absence of the teacher on the frequency and kinds of disturbing behavior exhibited by the children were examined. The findings suggested that the subjects engaged in a higher frequency of disruptive behaviors in the regular classroom. Disorganized and hyperactive behaviors were lessened in the special class by the teacher's support, reminders and provision of structured play

opportunities. In contrast, in the regular class, the students spent a great deal of time wandering alone, oblivious, and self absorbed. Aggressive, defiant, and manipulative behaviors were controlled by firm and consistent limits in the special class but aggravated by teacher ignoring in the regular classroom. The special class teachers were also present more often than the regular class teachers. This finding should not be a surprise, however, since many handicapped students require a more structured setting and a smaller staff student ratio, especially at the preschool level.

In terms of more appropriate behaviors, severely handicapped students emmitted more social behavior to other students in integrated (with nonhandicapped students) contexts in comparison to their own behavior in segregated (with other handicapped students only) contexts (Brinker & Thorpe, 1984a). More of their social behavior had a positive affective tone in integrated contexts. In integrated settings, contingencies of social reinforcement were provided by nonhandicapped students for a higher proportion of social output of severely handicapped students in comparison to contingencies of social reinforcement provided in segregated settings. Such differences in social behavior, as a function of social context, provide important information to special educators whose goal it is to increase the social skills of severely handicapped students.

The preceding studies have demonstrated a functional relationship between behavior and certain environmental variables. They also indicated that more inappropriate behaviors occur in institutional settings and more appropriate behaviors in community settings. It is apparent that both institutional and community settings include numerous variables related to the occurrence or nonoccurrence of specific behaviors.

Staff. Numerous factors related to staff have a major impact on skill acquisition of their students. These factors include expectations, training, program implementation, burn out, and other day-to-day performance tasks.

Several different methods have been employed in an effort to provide appropriate training to staff who work with severely handicapped individuals. Workshops are frequently used to deliver training and generally consist of prepared talks (Hegedus, McCarthy & Scipien, 1973), audio visual aids (Educational Technology, 1969), case presentations and live demonstrations (Foster, 1970), discussion groups (Rossier and Steiger, 1969), handbooks and text (Adler & DeBlois, 1973), specially prepared instructional materials (Root, 1969), and questionnaires allowing participants to evaluate the workshop (Johnson & Ferryman, 1969). In objectively rating the services provided by six institutions for the retarded, Klaber (1969) found that the least effective of the six had the strongest in-service training program and concluded that, overall, there was simply no relationship between institutional effectiveness and in-service training. The problem appears to be that of management as opposed to lack of competency.

Attendants, aides, and paraprofessionals are significant trainers in both institutional and public school settings for severely

handicapped students. Therefore, the performance of personnel who work with this population is of great importance. Panyan, Boozer, and Morris (1970) investigated the use of a feedback system which increased the daily use of operant training methods by non-professional hall personnel in a state institution. The procedure included weekly delivery and posting of feedback sheets which increased the percentage of training sessions conducted. Since attendants often number as much as 50% of an institution's entire employee population, and since they are in direct contact with residents, such staff obviously constitute an invaluable pool of behavior change agents. However, observational studies of attendants' behavior on the ward have indicated that they spend relatively little of their total work time interacting with residents in training (Harmatz, 1973), or in social play (Daily, Allen, Chinsky & Veit, 1974).

A study conducted by Burg, Reid, and Lattimore (1979), involved the management of staff behavior in residential facilities for handicapped persons. These researchers investigated the use of a self-recording and supervision program to increase interactions between direct care staff and profoundly retarded persons. Staff were provided with instructions regarding what to self-record, criteria for how many interactions to record, and a prepared card on which to make the recordings. The staff supervisor intermittently monitored staff-client interactions. Observations indicated that when the staff recorded their interactions with clients in a loosely structured dayroom setting, the rate of interactions increased noticeably for each staff person. Behavior ecology measures in this study indicated that other staff responsibilities such as maintaining the cleanliness of residents and the physical area, were not affected detrimentally when social interactions increased and actually showed small improvements. Also, small decreases in resident self-stimulatory and disruptive-aggressive behaviors occurred when the rate of social interactions from staff persons increased.

Pomerleau, Bobrove and Smith (1973) modified the aide-resident relationship by providing aides with information about the behavior of assigned residents, cash awards based on the improvement of assigned residents, and different kinds of supervision by staff. Appropriate behavior of residents increased when aides were given information and when cash awards were contingent on the behavior of the residents. However, the behavior of residents deteriorated when the program was terminated.

After studying six state institutions, Klaber (1969) made several recommendations, of those, size was the most important and size did have a bearing on staff effectiveness. If size is one of the most significant factors in enabling people to be treated as individuals, then the goal should be to keep institutional populations small. A second conclusion of Klaber (1969) concerned the role of the non-attendant institutional staff. Their contribution was deemed so important relative to their number that it was recommended that better educated and better motivated aides be trained to function as occupational and recreational therapists.

Most of the research conducted has focused on training institutional staff who basically include aides, paraprofessionals and assistants. Teachers in both institutional and community settings have the responsibility of providing training to assistants and teaching students in the classroom. Since the standards for certification of teachers set by the state departments of education determine hiring practices, both teachers in institutional and community settings have similiar backgrounds in training. Studies have yet to be conducted to determine attitude differences and burn-out rates of teachers in each of the designated settings. However, Fredericks, Anderson, and Baldwin (1979) at Teaching Research in Oregon, discovered in a large-scale research project on the parameters of teacher-training effectiveness, that measured instruction was one of the few variables of many they studied that reliably predicted child change as a function of teaching effectiveness. The more teachers collect and utilize their data, the faster the students progress. Similiar findings were offered by Sailor and Guess (1983), who noted that their most successful and also their most satisfied (least likely to burn-out) were teachers who were avid data collectors.

Instructional Procedures. The success or failure of educational programming for the severely handicapped population depends significantly on the instructional procedures and the manner in which they are implemented. Numerous instructional procedures have been researched with the severely handicapped population in both institutional and community settings. Welch and Pear (1980) conducted a study in which picture cards, photographs, and real objects were compared as training stimuli in order to determine which best facilitated the generalization of naming responses learned in a special training room to real objects in the natural environments of four retarded children. This comparison is quite similar to training in an institutional setting versus a public school setting because an institutional setting is more contrived and a public school setting in the community more closely approximates the natural environment. Three of the four children in this study displayed considerably more generalization to the real objects in the natural environment when they were trained with real objects. This study has great implications for training in numerous domains such as independent living skills, self help skills, and survival skills. Results also suggested that training in more than one setting may facilitate setting generalization and that the "pairings" procedure (i.e., training in special training room and the natural environment) may facilitate intermodal transfer. This technique is classified by Stokes and Baer (1977) as "training sufficient exemplars," also considered a form of training generalization.

In programming for severely handicapped students, it is important to train generalization rather than make the assumption that it will occur. With this awareness, the significance of the environmental setting is further emphasized, and some would argue that students in public schools are generally provided more of an opportunity to function in the natural environment. Placement in the natural environment is often prevented because of various inappropriate behaviors or lack of appropriate behavior in the severely

handicapped child's repertoire. For example, Singer, Close, Irvin, Gersten, and Sailor (1984) implemented a rural deinstitutionalization model in which students exhibited extreme behaviors such as self-abuse, aggression towards others, destruction of property and severe tantruming upon leaving the institution. A significant portion of their behavior management program involved their participation in an active schedule of leisure and community events that provided them with opportunities to engage in adaptive behaviors. For many problem behaviors this intervention worked. Of those who did not improve, a generalized compliance training procedure was implemented following Englemann and Colvin's (1983) guidelines. This technique is a multi-element treatment procedure. It provided systematic instruction on following directions across settings, materials, and persons.

Systematic instruction and other instructional procedures have been utilized in facilitating skill acquisition across various curriculum domains. One example is in the area of communication deficits, which are a common deficit among students with severe handicaps. In viewing communication deficits, it is important to understand that physical disabilities that stop speech development do not necessarily prohibit acquisition of receptive language. Handicapped persons without vocal skills who comprehend spoken language have been noted frequently (Goda, 1969; McDonald & Schultz, 1973; Shaffer & Goehl, 1974; Vanderheiden, Brown, MacKenzie, Reinen, & Scheibel, 1975; Vicker, 1973). Many times these handicapped individuals comprehend conversational speech but actually communicate with only a limited number of people who can interpret their nonvocal idiosyncratic movements. In these instances, nonvocal training is usually required. Reid and Hurlbut (1977) conducted a study in which four physically disabled residents in a state institution were taught to use either a prosthetic head pointer or to point with a hand in using a communication board for expressive language. Coordination training was implemented, consisting of instructions, manual guidance, praise, feedback, and practice. Each resident demonstrated a higher frequency of accurate pointing to designated areas on the board. Results also demonstrated that communication board skills were functional in providing a method of expressing a choice of a leisure activity to people who previously could not understand the subjects' communication attempts. These findings have implications for increasing communications in both institutions and public school settings. This is particularly important for institutional settings because there may be fewer opportunities to communicate due to lack of availability of peers with higher level communication skills and minimal feedback for staff members. The study also indicated that even individuals who have been institutionalized for lengthy periods of their lives without functional communication skills can be taught skills that will allow them more interaction with others in their environment.

In addition to communication skills deficits, self help skills are commonly found lacking in severely handicapped students. This being the case, a number of procedures have been developed to teach self help skills. Extensive task analysis has been frequently used to train skills such as toothbrushing (Baldwin, Fredericks, & Brodsky, 1973; Horner & Keilitz, 1975); travel skills (Neef, Iwata & Page,

1978); toilet training (Dunlap, Koegel & Koegel, 1984); mealtime skills (Foxx & Azrin, 1972). The significant factors in each of the programs included systematic program development, implementation, and evaluation. However, it is rarely administratively feasible to carry out some programs in an institutional setting. For example, O'Brien and Azrin (1972) trained a staff member to perform both acquisition training and maintenance for implementation of a meal-time program in an institution. Procedures consisted of one or two short meetings with the staff member, the reading of a seven page description of the program and performance of the procedures under the direct supervision of persons already trained.

Some researchers have suggested that certain procedures for teaching self help skills and independent living skills are more successfully implemented in one setting as opposed to another. McDonnell, Horner, and Williams (1984) examined the effectiveness of three strategies for purchasing grocery store items with four high school students labelled moderately and severely retarded. Two simulation approaches were compared: one which carefully presented training stimuli that were similar to the type and range of stimuli present in the community (slides) and one which presented training stimuli that were very dissimilar from community stimuli (flashcards). Neither simulation approach was effective in producing a generalized skill. Only after students received combined slide training and in vivo training were functional effects produced. Similarly, Neef, Iwata, and Page (1978) conducted a study that evaluated a classroom program to teach public transportation usage (bus riding skills) to retarded persons. These authors used task analysis of specific skills that were taught sequentially, using training procedures consisting of role playing, manipulating the actions of a doll on a simulated model, and responding to questions about slide sequences. Results indicated that up to 12 months after termination of training, each subject exhibited appropriate bus-riding skills on actual city buses, suggesting transfer from the classroom to the natural environment. The authors trained two others subjects in vivo, on city buses. Both subjects acquired appropriate bus-riding skills; however, the in vivo training procedure was both more time consuming and expensive than classroom training. Findings from this study demonstrated the effectiveness and practicality of properly designed classroom training procedures for teaching community survival skills to retarded persons. These results could have a great impact on training of students who are in more confined settings, such as institutions.

Another important area of training for severely handicapped persons that should be mentioned is toilet training. This is an area that presents problems in both community and institutional settings. Additionally, due to this problem of overcrowding in institutional wards, group training has been frequently used. For the severely handicapped individual, this may be grossly inappropriate. Azrin and Foxx (1971) also suggested that generalization of the toilet training to the resident's natural environment would be more effective if conducted in that very environment and by the very ward attendants normally present there.

As these studies suggested, the setting, teaching procedures, curriculum, and program implementation all contribute to the failure

or success of the educational programming for severely handicapped students in both institutional and community settings. However, in order to achieve the goal of self sufficiency and independence, programming in the natural environment appears most appropriate.

Social Interaction. Various studies have indicated that early institutionalization usually has an adverse effect on mental, social, and emotional development (Goldfarb, 1945; Provence & Lipton, 1962). These studies demonstrated, in part, the lack of opportunity for for social interactions in an institutional setting. Social interactions can be facilitated, however, when subsequent events such as adult attention (Allen, Hart, Buell, Harris, & Wolf, 1964; Hart, Reynolds, Brawley, baer, & Harris, 1968; Patterson & Brodsky, 1971), peer attention (Wahler, 1967), and material reinforcers (Kirby & Toler, 1970; Whitman, Mercurio, & Caponigri, 1970) are delivered contingent on a child's contacts with his peers, consequently, social interaction with peers increases, and the child's social isolation correspondingly diminishes.

Given that integration has been found to increase social interaction opportunities, does this increase have any educational impact upon severely handicapped students? This is a question that has been frequently asked. Brinker and Thorpe (1984b) conducted a study designed to determine whether the amount of integration experienced by a severely handicapped student was related to the proportion of educational objectives achieved by that student at the end of the year. Observation of the rate of interaction with nonhandicapped students was the measure of degree of integration. The proportion of Individual Educational Plan (IEP) objectives achieved for each student by the end of the year was the measure of educational progress. Results suggested that integration can be an addendum to individualized, specialized, educational settings and integration can have positive educational benefits. The authors suggested that an important feature of integration is that nonhandicapped students are not specialized instructional personnel. Children and adolescents provide a more variable social interactive environment than teachers do. Adult staff are more likely to provide such consistent cues within a particular training format that the child learns "now it's time to talk" or "now it's time to imitate actions." The greater variety in peer interactions prevents the type of discrimination learning which others have reported as characterizing handicapped students in teacher-student learning situations (Guess & Siegel-Causey, in press; Guralnick, 1982; Strain & Kerr, 1981).

Though social interactions have been demonstrated to be beneficial to both handicapped and nonhandicapped students, merely placing them in the same setting does not insure that interactions will occur. Various techniques have been used to facilitate such interactions. For example, Bambara, Speigel-McGill, Fox and Shores (1984) manipulated the proximity of non-ambulatory handicapped children in a classroom setting and observed increased social interactions when children were placed closer to each other. On the other hand, if students are not in the same setting there is neither the opportunity for using these techniques nor the opportunity for interactions to occur.

Summary and Conclusions

The significance of chronologically age-appropriate educational environments and the identification of ecobehavioral variables operating in the environment, is apparent from the preceding research. Because severely handicapped students are viewed in terms of mental age and because there are no nonhandicapped students in institutional settings, these settings are typically not chronologically age-appropriate. On the contrary, in public school and community settings, there is at least the availability of nonhandicapped students of the same chronological age. In addition to nonhandicapped peers, age-appropriate educational environments, materials, activities, curriculum, staff, and overall programming are important variables to be considered in both institutional and community settings.

In summarizing the significance of the environment on the teacher and staff, we look first at the institutional setting. In this setting, it is difficult for teachers to maintain an awareness of chronologically age-appropriate materials and activities because they are typically unable to maintain contact with regular teachers and nonhandicapped students. Thus, they become unfamiliar with what transpires in the regular classroom setting and the community environment for which they are supposedly preparing their students. Secondly, in order for teachers to implement overall effective programming, a functional and naturalized curriculum is required (Brown, Wilcox, Sontag, Vincent, Dodd, & Gruenewald, 1977). This means programming with nonhandicapped students in social, vocational, recreational, and domestic environments, performing skills when and where they would naturally occur. In drawing conclusions from this viewpoint, an overwhelming majority of professionals in the field of mental retardation suggested the most appropriate treatment of mentally retarded persons occurs in settings that are as normalizing as possible (Ferleger & Boyd, 1979; Menolascino, 1977; Menolascino & McGee, 1981a; 1981b; Nirje, 1969; Wolfenberger, Nirje, Olshansky, Perske, & Ross, 1972).

Additionally, a plethora of research data are available to support the contentions that: prolonged institutionalization has destructive developmental consequences (Baroff, 1980; Blatt, 1970; Blatt & Kaplan, 1967; Flint, 1966; Goffman, 1966; Holderman vs Pennhurst, 1977; Moore & Grant, 1977; Taylor, 1977); appropriate community based residential settings are generally more beneficial than institutional placements (Conroy, Lemanowicz, Sokol, & Pollack, 1980; Ferleger & Boyd, 1979; Gilhool, 1978; Kushlick, 1969); and mentally retarded individuals with a wide spectrum of disabilities, including the severely and profoundly retarded can be successfully served in community-based setting (Bicklen, 1979; Bogdan & Taylor, 1976; Dybwad, 1969; Edgerton & Bercovici, 1976; Gollay, Friedman, Wyngarder & Kurtz, 1978; Menolascino & McGee, 1981a; 1981b; Tizard, 1969). Though court cases dealing primarily with right-to-treatment issues have been introduced in several states, many institutions have yet to reform fully. In a landmark case, Wyatt vs. Stickney (1971), the ruling established a detailed procedure for treatment implementation, which included many provisions to ensure a humane psychological environment, minimum staff standards, provision for

individualized evaluation of residents, habilitation plans and programs, and requirements that every retarded person be placed in the least restrictive setting necessary for habilitation (Sontag, Smith, & Certo, 1977). The literature suggested that institutions are not the most appropriate setting for severely handicapped students and that they will have to change tremendously in order to become a more appropriate environmental setting for severely handicapped individuals. Ecological variables in institutions and community settings clearly affect behavior exhibited by severely handicapped individuals. These variables included the size of the settings, competencies of the staff, appropriateness of materials and activities, instructional procedures, opportunities for generalization of skills to the natural environment, and opportunities for social interactions with nonhandicapped peers and other adults.

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CHAPTER VI

MICRO-ETHNOGRAPHIC AND ECOBEHAVIORAL RESEARCH METHODS: IMPLICATIONS FOR BILINGUAL EDUCATION

GENE T. CHAVEZ

Abstract

The micro-ethnographic research approach and the ecobehavioral research methodology as they are applied to classroom settings, have a very similar research goal; the understanding of the nature of teaching-learning relationships.

While both methods focus upon the study of environmental stimuli that provide the occasion for students to behave, micro-ethnography most often describes what happens in a given environment through verbatim accounts, narrative records, and in generally less than quantitative methods. Ecobehavioral research methodologies most generally employ techniques of reporting that are quantitative.

In this chapter, the ecobehavioral research methodology is recommended as a new technique for examining the educational environments in which limited English proficient students are found. The obvious advantages of a quantifiable approach such as this include: (a) time effectiveness, (b) cost effectiveness, and (c) the opportunity for generalization beyond the single case.

Introduction

In recent years, the ethnographic research method has been applied to sociocultural interactions as a key to understanding the nature of teaching-learning relationships within school settings designed for limited English proficient (LEP) students. More recently, educational researchers have focused on a type of qualitative research called micro-ethnography. As the name suggests, this approach is more limited in its scope than traditional ethnography in that specific delineations are made in micro-ethnography to focus on specific classroom processes. One of the basic assumptions of this type of sociocultural research in multiethnic classrooms is that student-teacher interactions constitute the core of the education process (Gay, 1978). Thus, micro-ethnographic research examines details of the thousands of interactions that occur in the classroom each day.

A second new trend applied to the understanding of teaching-learning relationships within school settings is ecobehavioral research. Rogers-Warren's (1984) definition then leads us to understand ecobehavioral research as a hybrid form of behavior analysis. This approach results from the incorporation of the broader definitions of behavior and environment found in ecological psychology with the functional analysis of behavior for therapeutic purposes characteristic of applied behavior analysis. LeLaurin (1984) elucidated the subject further calling our attention to

Willems, (1974, 1977) assertions that there were relationships between persons and their proximate and distal environments that transcended traditional behavioral analyses of response-consequence interactions. In fact it was Willems that urged for a "marriage" of the methodologies of ecology and behavior analysis to create a new science of "ecobehaviorism", that could find, measure and test for these multiple interactions, as well as bring to light "ripple effects", and avoid possible unintended negative effects.

This paper will explore commonalities that might exist between micro-ethnology and ecobehavioral research methodologies. While both micro-ethnographic and ecobehavioral research methods focus upon the study of environmental stimuli that provide the occasion for students to behave, the former most often describes what happens in a given environment through verbatim accounts, narrative records, and in general, less than quantitative methods. Ecobehavioral research methodologies most generally employ techniques of reporting that are quantitative.

The ultimate implication of this chapter relates to what Skinner (1984) called a conspiracy of silence about teaching as a skill:

> "We must beware of the fallacy of the good teacher and the good student. There are many good teachers who have not needed to learn to teach. They would be good at almost anything they tried. There are many good students who scarcely need to be taught. Put a good teacher and a good student together and you have what seems to be an ideal instructional setting. But it is disastrous to take it as a model to be followed in our schools, where hundreds of thousands of teachers must teach millions of students. Teachers must learn how to teach, and they must be taught by school of education. They need to be taught more effective ways of teaching" (p. 950).

Before teaching can be improved among those who teach Limited English Proficient (LEP) learners, a great deal more needs to be known about these students. This paper examined some of the special educational needs of LEP students in an attempt to provide a background for a better understanding of these students' instructional needs.

Variables Affecting Academic Learning of LEP Students

The interactions that LEP students have within instructional environments may greatly affect the educational progress of these students. Maheady (1985) suggested that one of the problems in the assessment of the bilingual exceptional child is that the medical model for assessment is used by educators when they are called upon to ascertain why students are experiencing difficulty in school. Educational diagnosticians readily assume that the dysfunctional behaviors are merely symptomatic of some underlying cause in the

student. They search for pathology using standardized tests. Once a cause has been identified and "accurately diagnosed", a treatment is prescribed. The problem with the "medical model" approach used to measure success in a school, is that the assumption is almost always made that something is wrong with the culturally different student (Ysseldyke & Algozzine, 1984). Yet there is ample data to suggest that many students fail to learn because they do not have opportunities to learn in their existing instructional environment and there are inherent difficulties in existing curricula materials and instructional techniques. Thus, the routine attribution of causation to children, fails to acknowledge the role that potentially alterable environmental factors play in producing school failure (Maheady, 1985).

A basic issue in the academic progress for culturally diverse LEP students is the problem of learning in the English language which is not part of their knowledge base. In order to understand the nature of this problem, researchers are beginning to examine what Heath (1983) called cultural schemata. That is, they are investigating second language acquisition within the context of the cultural content involved in the educational environment. Saville-Troike (1983) clarified this approach:

> "In addition to conveying information about the phonological, grammatical, and lexical nature of the English language, input to second language learners in an English speaking social milieu includes cultural information within which the emergent meaning of the code must be situated and interpreted. New words are encountered along with new cultural artifacts, new verbal routines with new social expectations in role relationships, and new rules for appropriate usage with new cultural values, attitudes, and belief" (p. 2-3).

Micro-ethnographic observation techniques used by Saville-Troike revealed the importance that the development of cultural competence seems to play in the educational progress of LEP learners. Saville-Troike (1983) found that the context of the school provided a conveniently constrained environment in which to observe the workings of cultural input and intake; that is, the interaction between language and culture and second language acquisition. She asserted concluded her report of these studies by stating that second language acquisition can only be fully understood within the larger understanding of the acquisition of a second culture.

Diaz, Moll, and Mehan (1986), in reviewing the theoretical base of the context-specific approach to understanding school difficulties of ethnically diverse students affirmed that at the heart of the context-specific approach is the study of the actual process of interaction between individuals and their environments, not just a measure of the products of interaction between individuals. They stated that, in the study of any learning

activity, the unit of analysis becomes the act or system of acts by which learning is composed, as seen in the context of the classroom, the school, and the community. They argued that the critical task in the analysis of educational interactions becomes the careful and detailed description of the learning activity (e.g., a reading lesson) and its constituent sequence of acts. Similarly, in a recent review of educational variables affecting the academic achievement of culturally and linguistically different learners, Arreaga-Mayer and Greenwood (1986), asserted that achievement can be negatively effected when: (a) the opportunity to learn and time on-task is low, and (b) when the structure of the instructional program is not oriented toward monitoring, controlling, and coordinating the amounts of academic responding for culturally and linguistically different learners.

In summary the research discussed in this section demonstrated that some of the ways to examine the special educational needs of LEP students include:

1. Monitoring, controlling, and coordinating the amounts of academic responding for culturally and linguistically different learners (Arreaga-Mayer & Greenwood, 1986).

2. Examining culturally induced behaviors that diverse LEP students bring with them to the classroom (Maheady, 1985).

3. Investigating second language acquisition by LEP students within specific cultural contexts (Saville-Troike, 1983).

4. Examining the actual process of interaction between individual LEP students and their environments of classroom, school, home, and community (Diaz, Moll, & Mehan, 1986).

In the following sections, this writer will present two research alternatives for examining the various needs of limited-English proficient students, namely, micro-ethnographic and ecobehavioral approaches. It is believed that these two methodologies present keys to future understanding of the nature of teaching and learning relationships within school settings designed for LEP students.

Micro-Ethnographic Research in Bilingual Educational Settings

A review of micro-ethnographic research as it has been applied to bilingual educational settings indicated that references to micro-ethnography are rare. Some studies in bilingual education from the larger field of ethnography asserted that communication necessitated a specialized and localized approach to language (Gumperz & Hymes, 1972). Along this line of questioning, Ramirez, Castaneda, and Herald (1974) urged for research of the ethnography of communications and cognitive linguistics based on the hypothesis that effective teaching strategies for language minority children could be developed if they could find out who uses which language for what specific functions within classrooms. They believed the answer to that question would effect the content of tests, texts, and other teaching materials, and perhaps most importantly, styles of teaching for particular classroom populations.

Settings for ethnography of communication research included not only classroom interactions, but also analysis of speech acts between parents and children, and between specific communities and representatives of external institutions. Heath (1977), lamented that at the present time few studies using methods of ethnography of communication are available for use in language planning in bilingual education. She felt that the ethnography of communication was emerging, however, from a period characterized by philosophical and programmatic debates over definitions of communicative competence. The result of this change she predicted would be an increase in the number of studies by anthropologists interested in education and particularly in the ethnography of communication.

Mehan (1979b) asserted that the ethnographic research approach meets the above requirements for studying classroom dynamics in bilingual situations. He stated that educators need to become aware of the norms, values, skills, and abilities that members of the community employ in their daily lives. He further stated that knowledge of similar descriptions of the academic and interactional skills reported in classrooms and other school situations, can help make linkages between the community and the school so that the actions required in the classroom are not in conflict with those required in the community. In a similar line of research, effects of teacher attitudes upon high school students' academic performance by describing students' and parents' point of view. She concluded that teacher perceptions toward social and ethnic differences govern teacher/student interactions and overall classroom curriculum.

In some recent ethnographic studies, the school in general, and the classroom in particular have been described as communities (McDermott & Gospodinoff, 1979; Mehan, 1979a; Bruck & Schultz, 1977). The classroom is like a community in that there are a number of participants who meet regularly in the same location. They meet for the ostensive purpose of achieving certain goals and objectives which are mainly academic in nature. Mehan (1977) described the classroom as a community with preferred patterns of action. The patterns of action, he said include the academic objectives to be met and the means to achieve them which are guided by rules and regulations. These classroom rules are normative. They are established by the members of a classroom community. Mehan (1977) further suggested that in order for students to become competent members of the classroom community, students must not only know what to do, they must also know when and where to do it. The classroom requires interactions with classroom situations in order to produce behavior that is appropriate for a given classroom situation. Students must interpret classroom rules and procedures that are often implicitly stated and which vary from situation to situation.

Moll (1981), discussed several interrelated features of micro-ethnography that are relevant and useful for the study of bilingual schooling. He argued that a micro-ethnographic approach to research provides a powerful way to study systematically the organization of bilingual learning environments, to identify areas of difficulty and to suggest concrete interventions for beneficial change. He identified key elements of micro-ethnography as (a) the use of

videotape as a data collection tool, (b) the participation of teachers as co-researchers, (c) the study of context as an interactional notion, (d) the use of communicative activities as a unit of analysis, and (e) a focus on the role of adults in the construction of learning environments. He argued that micro-ethnographic studies provide valuable insights into how learning is mediated by the adults in the classroom and how concrete activities of communication shape the way children cope cognitively with different learning tasks. These positions are also supported by Mehan (1977) and Florio and Walsh (1976).

In conclusion the foregoing discussion of ethnographic and micro-ethnoraphic approaches to research in the field of bilingual education settings demonstrated that the underlying patterns of behavior revealed the social structure of educational activities, which, in turn, influenced academic achievement (Bremme, 1976; Garfinkel, 1976; Mehan, 1979a; 1979b). While studies reviewed have yielded much important qualitative data and important insights into interpreting classroom interactions from an ethnographic perspective, there are at least three shortcomings.

1. The cost effectiveness, in personnel hours of sustained ethnographic research approaches prohibits broad application to the many bilingual educational settings that require and could benefit from in-depth study.

2. The cost effectiveness, in terms of dollars required to support investigations using the ethnographic and micro-ethnographic research approaches are very high.

3. While it is very desirable to incorporate the teacher as a researchers as in ethnographic and micro-ethnographic research approaches, it is not always possible to do so.

In addition to the above problems, add the problem of generalizability of qualitative insights. What is needed is a way of escaping what Erickson (1977) called "that tyranny of the single case". The following passage from a study by Bruck and Shultz (1977) which examined the language use patterns of two first grade children in a Spanish-English half-day pull-out transitional bilingual program illustrates the difficulty with regard to generalizability of ethnographic and micro-ethnographic studies.

> "Thus, 66 working days were devoted to the study of two bilingually-schooled students. Despite the amount of data collected and the amount of man hours invested in this study, we feel that our data are insufficient for making very general statements about the nature of language use patterns in these classrooms" (p. 86).

With these shortcomings in mind, let us approach the discussion of the ecobehavioral approach to research and its possible application to bilingual educational settings.

Ecobehavioral Research Applied to Bilingual Educational Settings

An emerging trend in behavioral assessment is the analysis of ecology benavior interactions within school settings. Greenwood, Schulte, Kohler, Dinwiddie and Carta (1985), defined ecobehavioral interactional approach as the the quantification of both changing situational factors and temporally related student responses with the context of direct observational assessment in natural settings. This emergence of ecobehavioral analysis as a well-defined area within applied behavior analysis has been to some extent, inhibited by lack of clear definition of what constitutes an ecobehavioral analysis and by a concommittant difficulty in defining units of analysis appropriate for such an approach (Rogers-Warren, 1984).

With the advent of recent improvements in observational systems and design methodology, researchers are beginning to establish clear relationships between classroom ecological variables (e.g., teacher behaviors, commands or instructions, materials used, tasks, etc.), and student outcomes (e.g., improved academic achievement scores). For example, Trueba, Guthrie, and Au (1981) demonstrated that the dramatic progress shown by students in programs that recognize their linguistic and cultural differences is not the result of changes in materials or curriculum, but stems from complex and subtle changes in the teacher-student relationship, in the organization of instructional tasks, and in the role students play as primary agents of their learning with these particular instructional arrangements.

To exemplify the power of ecobehavioral research, this author will cite a study by researchers at Juniper Gardens Children's Project, at the University of Kansas in which Greenwood, Delquadri, Stanley, Terry, and Hall, (1985) applied ecobehavioral interaction analysis within school settings. They examined the quality and frequency of complex instructional arrangements and their conditional association with the academic behavior of minority and non-minority students within fourth-grade classrooms. Students were randomly drawn from 14 fourth-grade classrooms in four elementary schools. Students differed in socioeconomic status since they were drawn from two inner-city, Title I schools and two suburban non-Title I schools (N=40; 10 from each school). The training and work experience of the fourteen fourth-grade teachers (all female) varied widely and no attempts were made to control these factors. Observational records spanning the entire school day were obtained for the 40 fourth-grade students and analyzed for derivation and replication samples. The instrument used in their observations was the Code for Instructional Structure and Student Academic Response (CISSAR), a comprehensive classroom observation system. The CISSAR was used to sequentially sample the ecology of instruction; that is activities (the subject of instruction); curriculum task type; structure (grouping arrangements); teacher position with respect to target student; teacher behavior; and the student's behavior (Stanley & Greenwood, 1981). The results were as follows: (a) instructional arrangements were differentially related to student responding, and (b) teachers of low socioeconomic students more frequently used instructional arrangements which were significantly less related to academic responding. The researchers concluded that

"the persistent problem of academic retardation in inner-city, poverty group children, as one example, may finally be pinpointed in terms of specific histories of structured events and response dependencies within home and school environments" (p. 345).

Among other findings made by Juniper Gardens Children's Project researchers using an ecobehavioral approach were as follows:

1. Inner-city minority group students, mostly blacks, showed significantly less active academic responding than suburban students even when intelligence measures and socioeconomic status were statistically controlled (Greenwood, Delquadri, Stanley, Terry, & Hall, 1982).

2. While 74% of the day in inner-city classrooms was devoted to academic subjects, only 25% of the day was spent in active academic responding (i.e., writing, talking, reading, asking or answering questions, or reciting). The majority of the classroom day (45% was devoted to passive attention (Hall, Delquadri, Greenwood, & Thurston, 1982).

3. Instruction arrangements were different in inner-city and suburban schools. In inner-city schools, teachers were more likely to assign seatwork and allow students to work independently (Greenwood, Delquadri, & Hall, 1984; Stanley & Greenwood, 1981).

4. Specific instructional arrangements were found to be most related to academic responding (e.g., generally those coded as including paper-pencil or reader tasks); others were found to be least related (usually those that included teacher-student discussion (Greenwood, Delquadri, Stanley, Terry, & Hall, 1982).

5. Academic responding was significantly correlated to reading and mathematics achievement. Of all response categories on the CISSAR code, academic behavior was most related to student achievement (Greenwood, Delquadri, & Hall, 1984).

6. Effects of intervention changes in instructional contexts and student responding, co-vary with achievement gains (Delquadri, Greenwood, Stretton, & Hall, 1983; Greenwood, Delquadri, & Hall, 1984; Greenwood, Dinwiddie, Terry, Wade, Stanley, Thibadeau, & Delquadri, 1984).

The researchers, at Juniper Gardens have demonstrated that an ecobehavioral interaction approach (i.e., process-outcome approach) can define the ways classroom procedures effect students' academic behavior and achievement, independently of socioeconomic level of minority group status. Similar data, supporting the use of ecobehavioral research is provided by researchers such as Henderson and Merritt (1968); Maheady et al., (1983); Trueba, Guthrie, and Au (1981); and Valencia, Henderson, and Ranking (1981). This type of data base can then lay the groundwork for precision interventions into the ecology of the classroom in order to promote more effective ways of teaching all children, and especially LEP learners.

These findings illustrate that interactive ecobehavioral

assessment is one way of examining immediate and delayed environmental factors in natural settings as are found in classrooms where minority students are taught. The solutions to many of the school related problems of LEP students (e.g., academic failure) require a more fundamental understanding of the ecobehavioral processes interacting with learning that begins with a comprehensive ecobehavioral interaction approach to assessment.

Not enough is known about the behaviors of LEP students as they interact with teachers, other students, and other stimuli (i.e., room arrangements, schedules, parent and/or student aides, to name a few) within school settings. In these settings ecobehavioral complexities which are the complicated effects and discontinuities in behavior that emerge as a function of behavior-environment relationships and the properties of settings must be examined. As with ethnographic and micro-ethnographic research approaches to understanding the LEP students' need within the larger context of a cultural community, so the ecobehavioral approach must examine behaviors of LEP students in environmental settings other than schools. This is necessary because behavior is largely controlled by the environmental setting in which it occurs. Since changing the setting will change behavior, it is important to investigate patterns of congruence, or lack of it, between behavior and environment. Once patterns are discovered, principles that account for the congruence can be formulated. Such an effort is important to the progress of LEP students because it promises to contribute to the design of effective school programs for these students.

Questions about the nature and characteristics of effective programs for LEP students are still being raised. No one knows for sure why Juanito can't read. What is important is the discovery of those teacher behaviors student behaviors and their interactions within the contexts of the school, the home and the community that are critical to school success. Since so little is known about those critical behaviors for LEP students within the various settings in which they occur, it would seem that Willems' (1977) advice on a general procedural guideline should be followed: (1) increase the number of behavior categories, measuring complex effects suggests monitoring of more than a few behaviors. These can be identified from preliminary observations, interviews with subjects and companions, theoretical considerations, or even common sense; (2) increase the number of persons observed. Complex effects may occur in the behaviors of persons other than the target; (3) observe other dimensions of behavior in addition to its type. Complex effects can show up in those other aspects (e.g., was the behavior done alone or with the aid of someone, who instigated it, how long did it occur, etc.); (4) lengthen the time period of observation. Complex effects sometimes show up only after some lapse of time; and (5) increase the number of settings in which the observations are made. Complex effects may show up across different settings (p. 53).

By heeding Willems' suggestions as well as following a carefully designed and controlled research program, most of the criticisms of traditional quantified observation systems used in educational research, cited earlier in this chapter, can be

overcome. To summarize, while the micro-ethnographic approach provides a lucid and detailed picture of the process of education for a few LEP students, the ecobehavioral approach promises to open new and more effective avenues to examine educational settings and to identify effective interventions for LEP students.

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CHAPTER VII

THE EFFECT OF POINT WITHDRAWAL ON ACADEMIC RESPONSE RATES IN THE JUNIPER GARDENS PEER TUTORING GAME

CHRISTOPHER F. NELSON

Abstract

The peer tutoring game developed at the Juniper Gardens Children's Project has been used successfully to improve reading, math, and spelling skills of elementary students. An integral component of the game is a point system through which tutees receive points for correct responses and following proper error correction procedures. Both tutors and tutees receive bonus points for appropriate tutoring behavior. This paper describes an investigation in which the point system was removed from spelling and math tutoring games in a second grade classroom. The results in one classroom suggest that once the tutoring game is in place, the point system can be removed with no apparent decrease in student response rate or achievement.

Introduction

Prominent in educational research literature over the past twenty years have been studies concerning peer tutoring (e.g., Delquadri, Greenwood, Stretton, & Hall, 1983; Dineen, Clark, & Risley, 1977; Johnson & Bailey, 1974; Niedermeyer, 1970). A number of the peer tutoring methods described in such studies have been "structured," employing formal tutoring procedures, differentiated roles for the tutor and tutee, and training in tutoring procedures for the tutors (Kalfus, 1984). These studies have involved both whole classrooms (Delquadri et al., 1983; Greenwood, Dinwiddie, Terry, Wade, Stanley, Thibadeau, & Delquadri, 1984; Heron, Heward, Cooke, & Hill, 1983) and smaller groups specially selected to participate in tutoring for remedial purposes (Greer & Polirstok, 1982; Young, Hecimovic, & Salzberg, 1983). Peer tutoring has been found to be an effective instructional technique in spelling (Delquadri et al., 1983; Jenkins, Mayhill, Peschka, & Jenkins, 1974), reading (Greer & Polirstok, 1982; Jenkins et al., 1974; Trovato & Bucher, 1980), word and letter recognition (Heron et al., 1983; Young et al., 1983), and arithmetic skills (Greenwood et al., 1984; Johnson & Bailey, 1974).

Several of the peer tutoring procedures have used some type of reward system to maintain proper tutoring behavior or to reinforce academic responses. Trovato & Bucher (1980) used chips during tutoring. These were exchanged for points after the tutoring session and then exchanged at home for agreed upon rewards. Robinson, Newby, & Ganzell (1981) awarded tokens to students each time they volunteered to serve as tutors for other students. The tokens were exchanged for the opportunity to play a pinball machine. Heron et al., (1983) used "star stamps" to reinforce desired tutoring behaviors. McCarty, Griffin, Apollini, & Shores (1977), in

a research brief, reported paying tutees five cents for each correctly solved multiplication problem.

Trovato and Bucher (1980) found that students who earned chips that were backed up with reinforcers at home significantly outperformed a control group (no chips) and group receiving chips but no rewards on measures of oral reading, comprehension, overall reading and daily reading performance records. Robinson et al., (1981) reported that the use of tokens resulted in a higher assignment completion rate than a "no tokens" condition. McCarty et al., (1977) found that payment of five cents based on group oriented contingencies increased arithmetic computation rates and peer teaching verbalizations to levels significantly greater than payment based on individual contingencies or not payment at all. Heron et al., (1983) did not systematically manipulate their reward system. In three of these four studies, then, the reward system was demonstrated to play a significant role in effecting desirable tutoring outcomes.

In the peer tutoring procedures used by the Juniper Gardens Children's Project, a point system is used (Carta, Dinwiddie, Kohler, Delquadri, Greenwood, Whorton, & Elliott, 1984). Tutees receive points after each correct academic response and for following error correction procedures. Both tutors and tutees receive "bonus points" from the teacher or program consultant for proper tutoring behavior. Points are summed at the end of the game to determine a winning team. That team name is recorded on a publicly displayed chart. Other rewards are tied to the point totals by the teacher or program consultant as deemed necessary.

While the point system is treated as an integral part of the Juniper Gardens tutoring procedure, its role has not been systematically examined. It is assumed that a primary function of the points is to maintain a high rate of academic responding (i.e., more practice) leading to higher achievement outcomes. The purpose of this study was to examine the effect on student responding of removing the points from the tutoring procedure.

Method

Subjects and Settings

This investigation was conducted with 29 students in a second grade public school classroom. The classroom was in an "open school." The room had two full walls (front and back) and two partial walls, one opening into the neighboring classroom and the other into a hallway. The school was located near the outer boundary of an urban school district and served a mix of urban, suburban and rural students.

Procedures

At the beginning of the spring semester, the Juniper Gardens Children's Project Classwide Peer Tutoring procedure was implemented in spelling and math. This procedure consisted of the following components.

1. Students were paired and assigned to one of two teams. The pairings and composition of the teams were varied every one or two weeks.

2. During a tutoring session, each student served as the tutor for 10 minutes and as the tutee for another 10 minutes.

3. The tutor read a math problem or a spelling word from a standard list prepared by the teacher and the tutee responded by writing the problem or the word and saying it out loud. New lists of spelling words and math problems were used each week.

4. The tutor awarded two points for a correct response. The points were marked by the tutor on a laminated score sheet. If a response was incorrect, tutees were required to write the correct response three times while saying it out loud. One Point was awarded for this behavior. Failure to follow this error correction procedure resulted in zero points for that trial. Bonus points were awarded to both tutor and tutee by the teacher or program consultant for proper tutoring.

5. At the end of the twenty minute session, students reported their point totals to the teacher who recorded them on a wall-chart, summed the points, and announced as the winning team the group of students with the most points.

6. Weekly tests were given over tutored material to monitor achievement. Periodic pre-tests were administered as well.

After Classwide Peer Tutoring had been in place for about ten weeks and daily response rates appeared stable, the points were removed from the spelling sessions. Point sheets were no longer distributed and the teacher made no reference to a winning team. In addition, bonus points were no longer awarded, being replaced by praise for proper tutoring. The points were then withdrawn in the math sessions. During the conditions of point withdrawal, the error correction procedure remained in place. These manipulations took the structure of a multiple baseline experimental design across the two subject areas, reading and math. In this case, the standard tutoring procedure served as the baseline condition and the withdrawal of points as the intervention. Student responding was monitored for each session by counting the total number of spelling words or math problems (correct as well as incorrect) written on each student's worksheet.

Results

The results of this investigation are presented for the class as a whole and then individually for five students in the class. These five students were selected to illustrate the effect of the point withdrawal on students responding at relatively low rates during baseline (the standard tutoring game) and those responding at relatively high rates.

Class Results

Figure 1 shows the mean number of written math and spelling responses for the class across the conditions of the study. Examining these data, it can be seen that there was a clear increase in the mean spelling response rate upon the initial withdrawal of the points. This increased rate was not clearly maintained during the course of the no-points condition. During the first baseline, students wrote spelling words at a mean rate of 51.8 per tutoring session; during the first no-points condition, the mean rate was 62.3 words. The figure shows that the rates did not change substantially during subsequent return to baseline and no-point conditions, although these latter phases were too short (occurring at the end of the school year) to be conclusive. As noted on the graph, the teacher used a more difficult word list during the last week of the study.

When the points were withdrawn in the math tutoring sessions, the overall mean rate of math problems written per session increased from 29.4 to 41.0. Upon the reintroduction of points during the last five math tutoring sessions, the rate decreased to 23.8. These overall results for both spelling and math run counter to what one would expect were the points maintaining the response rates.

Figure 2 displays the mean spelling and math weekly test scores for the class during the first baseline (standard game) and first intervention (no-points) conditions. While the number of tests administered during the no-points conditions is small, the data suggest no difference in either spelling or math scores between conditions. The overall mean spelling posttest score during baseline was 93.2 and during intervention was 91.6. The overall mean math posttest score during baseline was 87.6 while the mean of the one test during the intervention condition was 98.0.

Individual Results

The number of spelling words and math problems written per session are displayed across conditions for five students individually in Figures 3 through 7. The mean number of spelling words and of math problems for the baseline and no-points conditions are shown for each of the five students in Table 12

Students 1, 2, and 3 wrote both spelling words and math problems at rates higher than the class mean during the first spelling and math baselines. The data for Student 1 show a relatively stable response rate during both the spelling and math baselines. Spelling rates generally increased (the expected pattern as the student accumulates more practice with a word list) during four of the five baseline weeks and math rates generally increased during five of the seven baseline weeks. When points were withdrawn in spelling, Student 1's rate increased at the beginning of the week and then declined during the rest of that week, a pattern similar to that of the whole class. Table 1 confirms that, as suggested by Figure 3, Student 1's overall rate remained higher during the no-points condition (Mean = 90.2) than during baseline (Mean = 64.2).

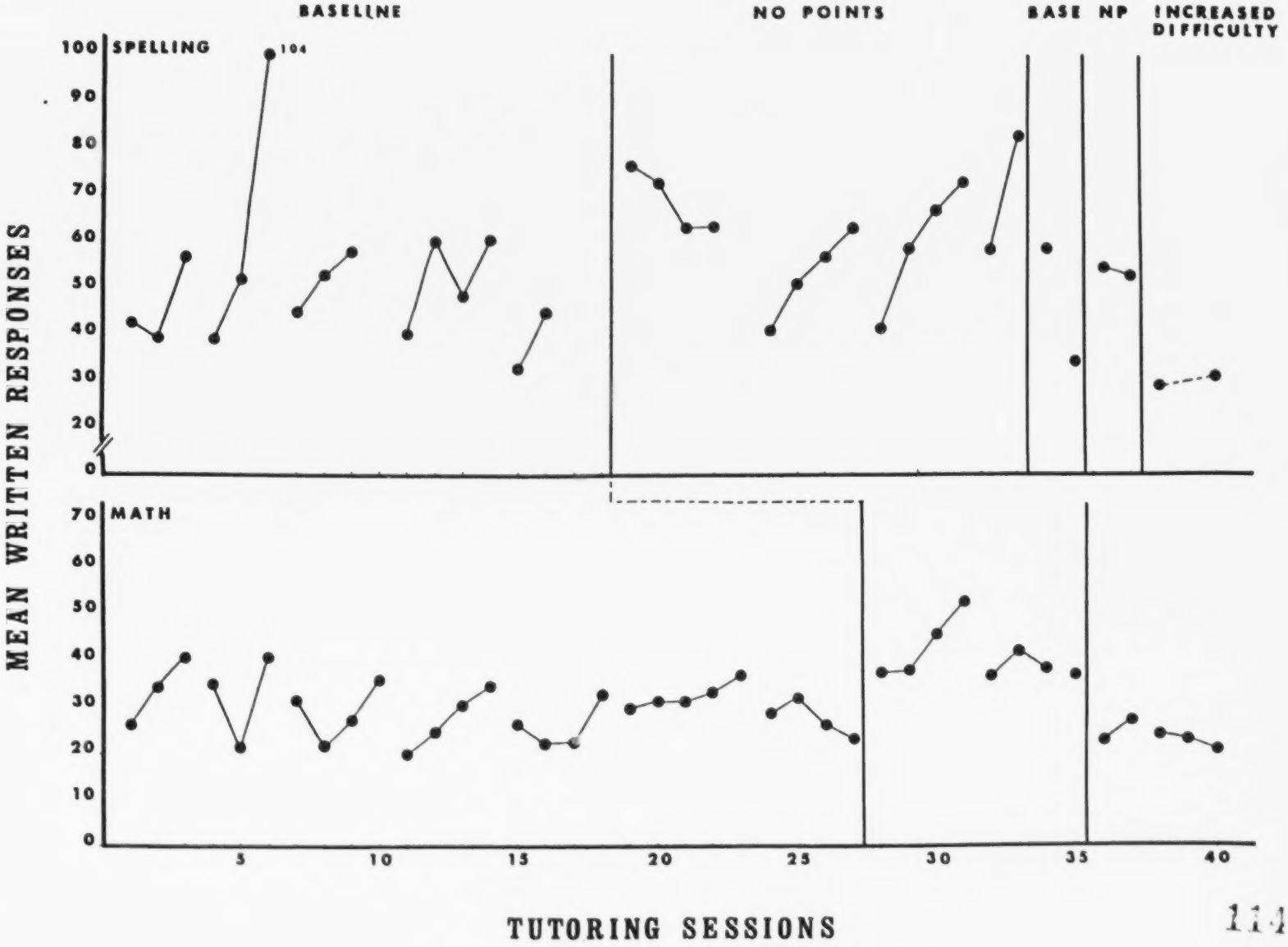

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Figure 1 - Class Weekly Spelling and Math Mean Scores Across Conditions

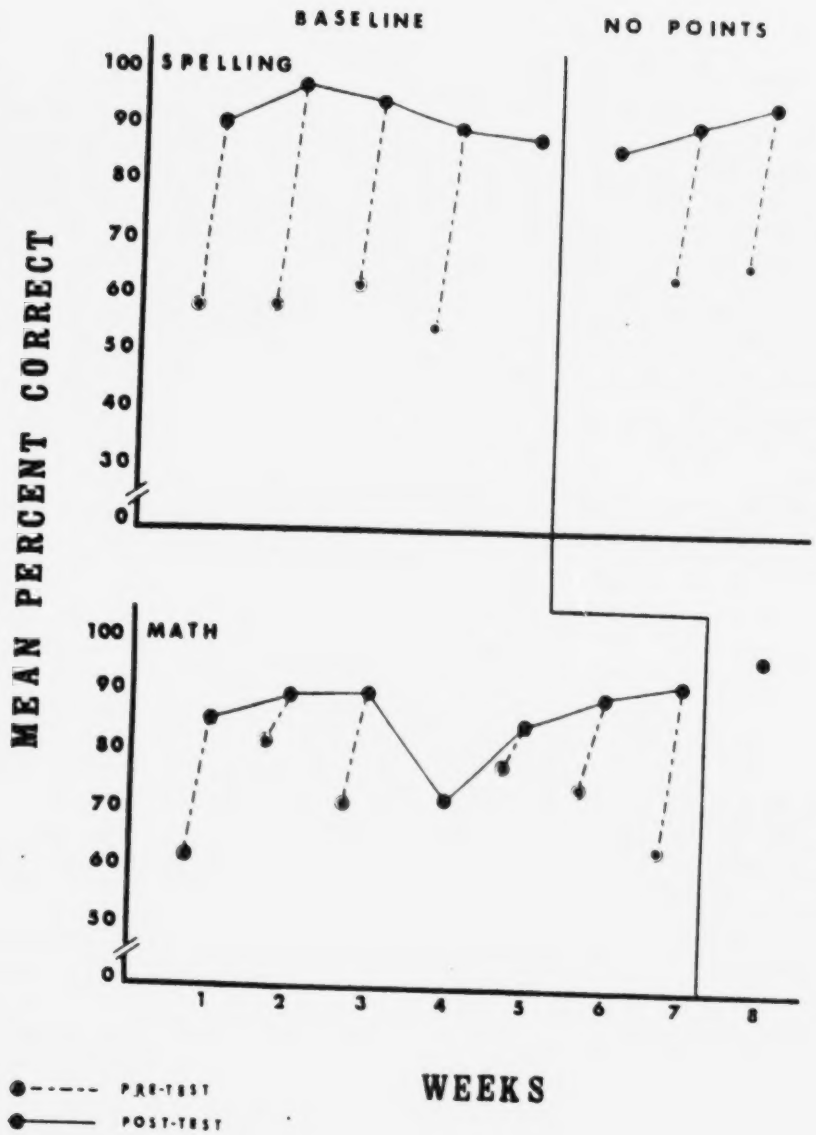

Figure 2 - Class Mean Percent Correct for Spelling and Math Weekly Test Scores Across Conditions

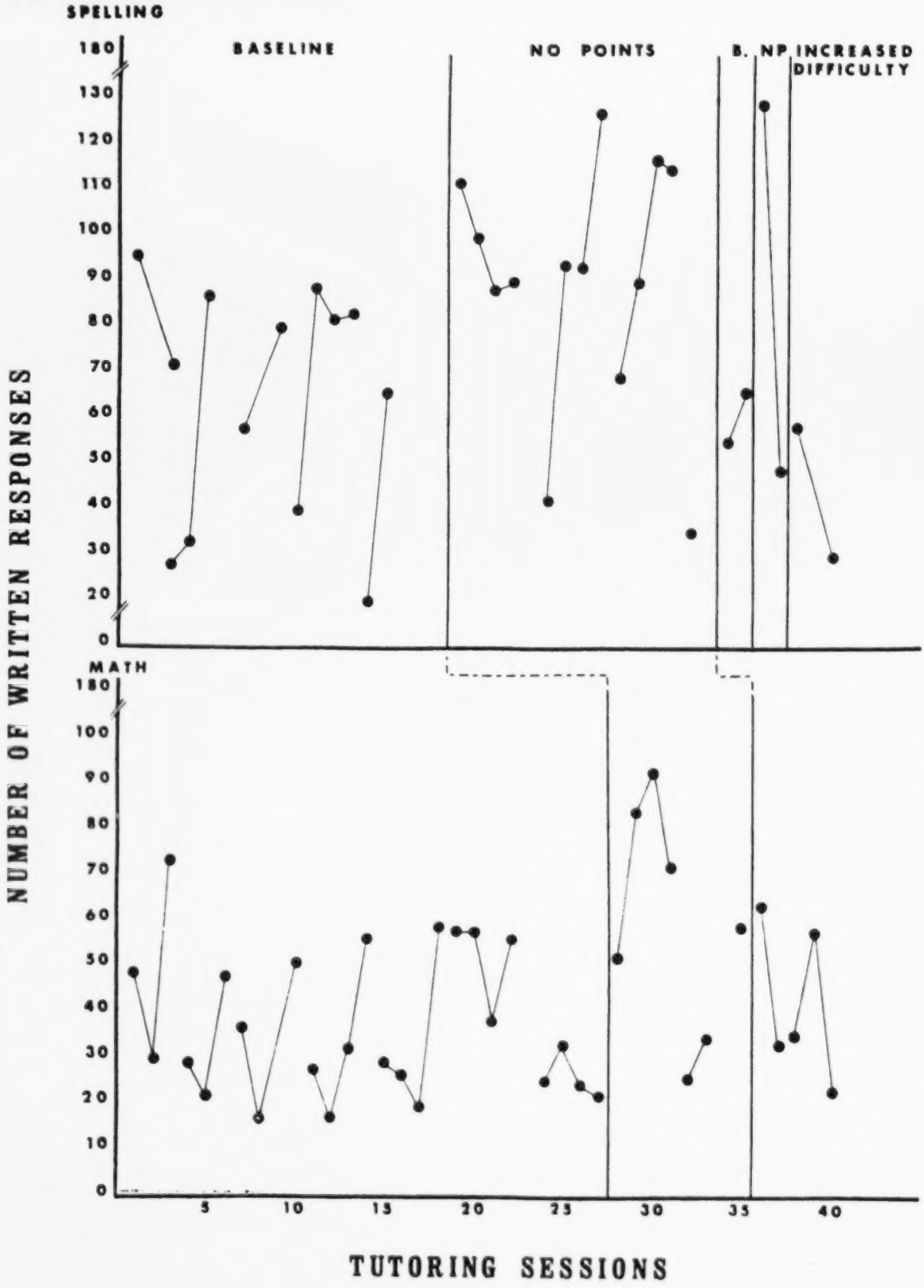

Figure 3 - Weekly Spelling and Math Mean Scores

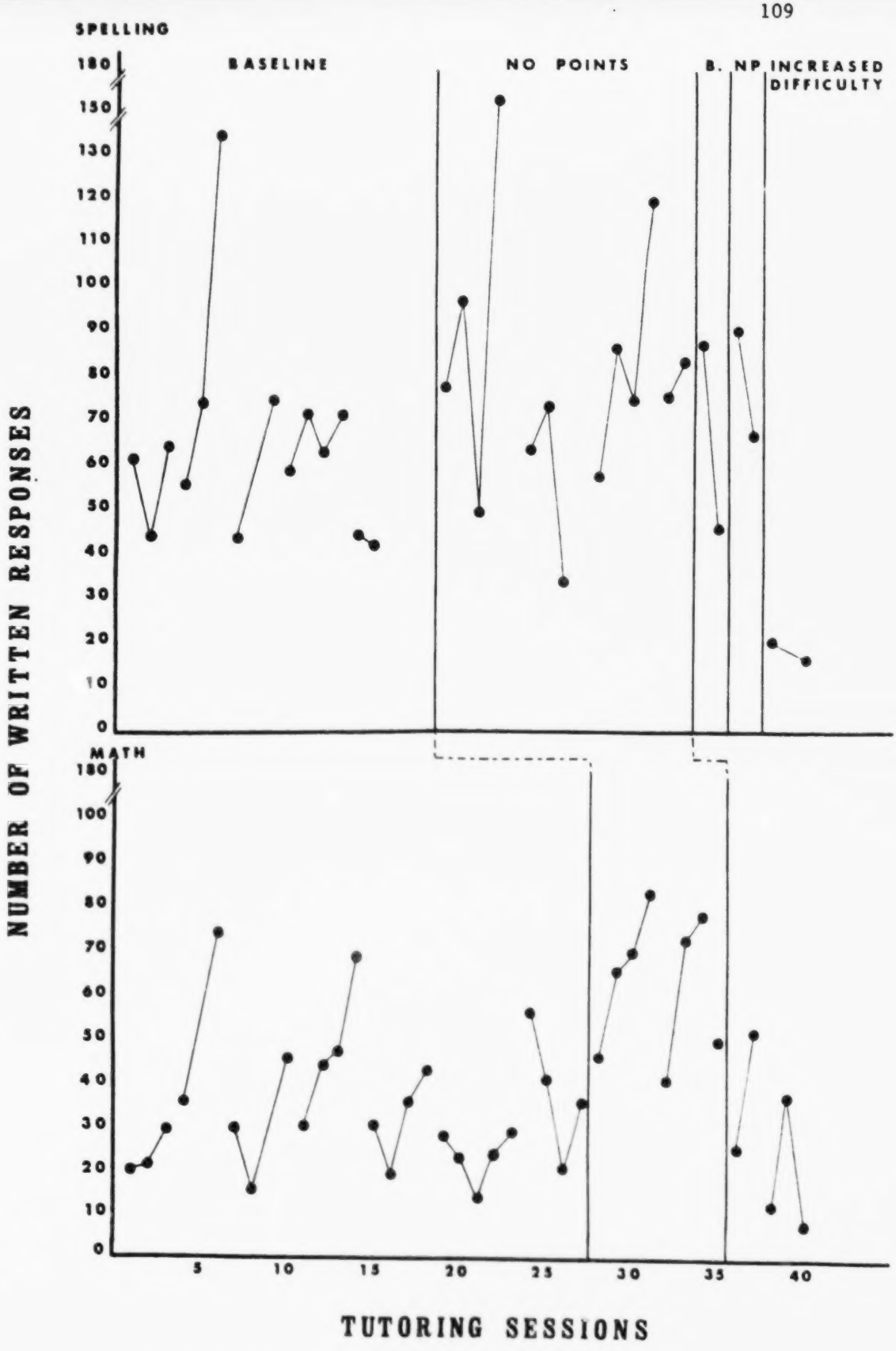

Figure 4 - Student 2: Weekly Spelling and Math Mean Scores

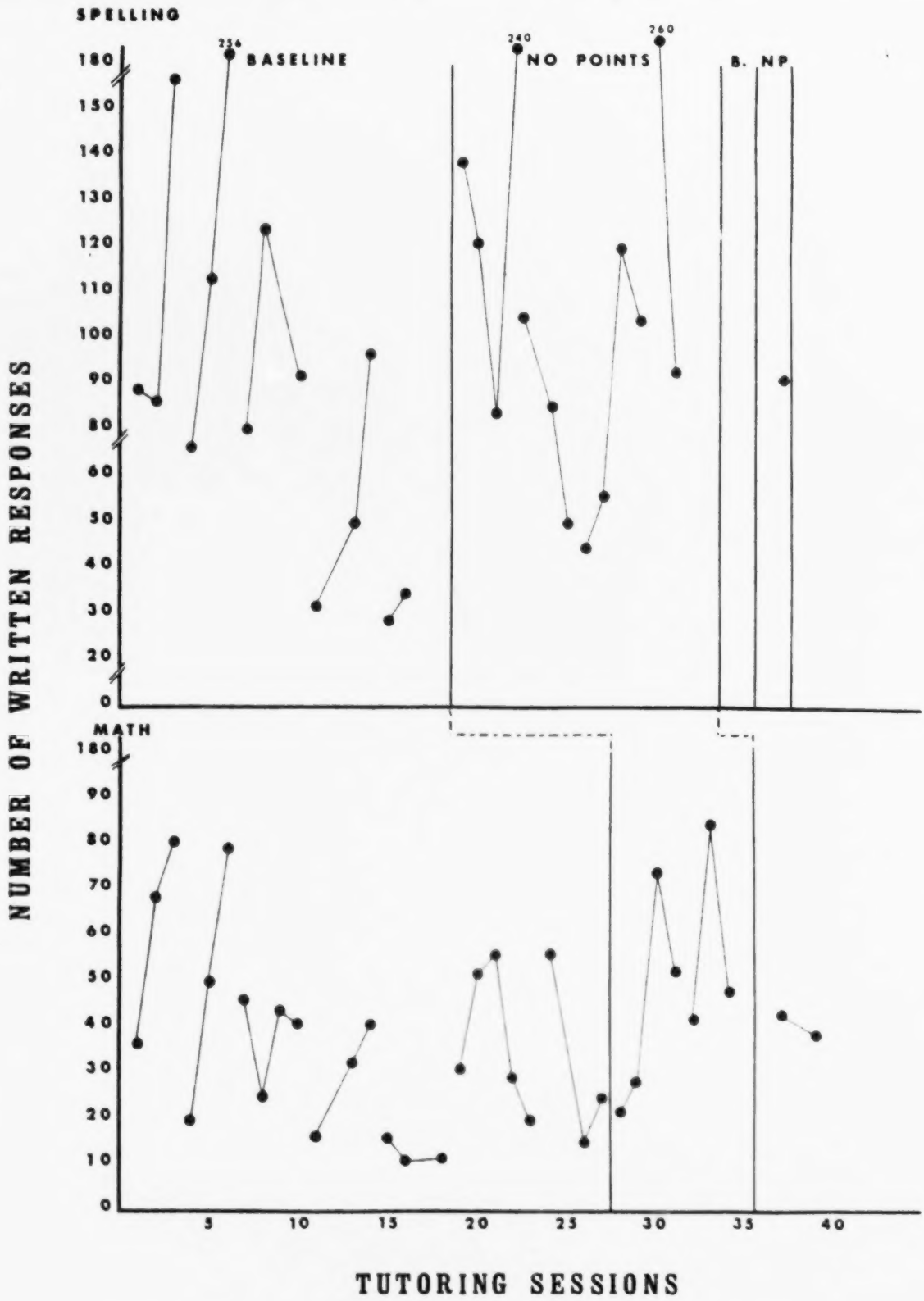

Figure 5 - Student 3: Weekly Spelling and Math Mean Scores

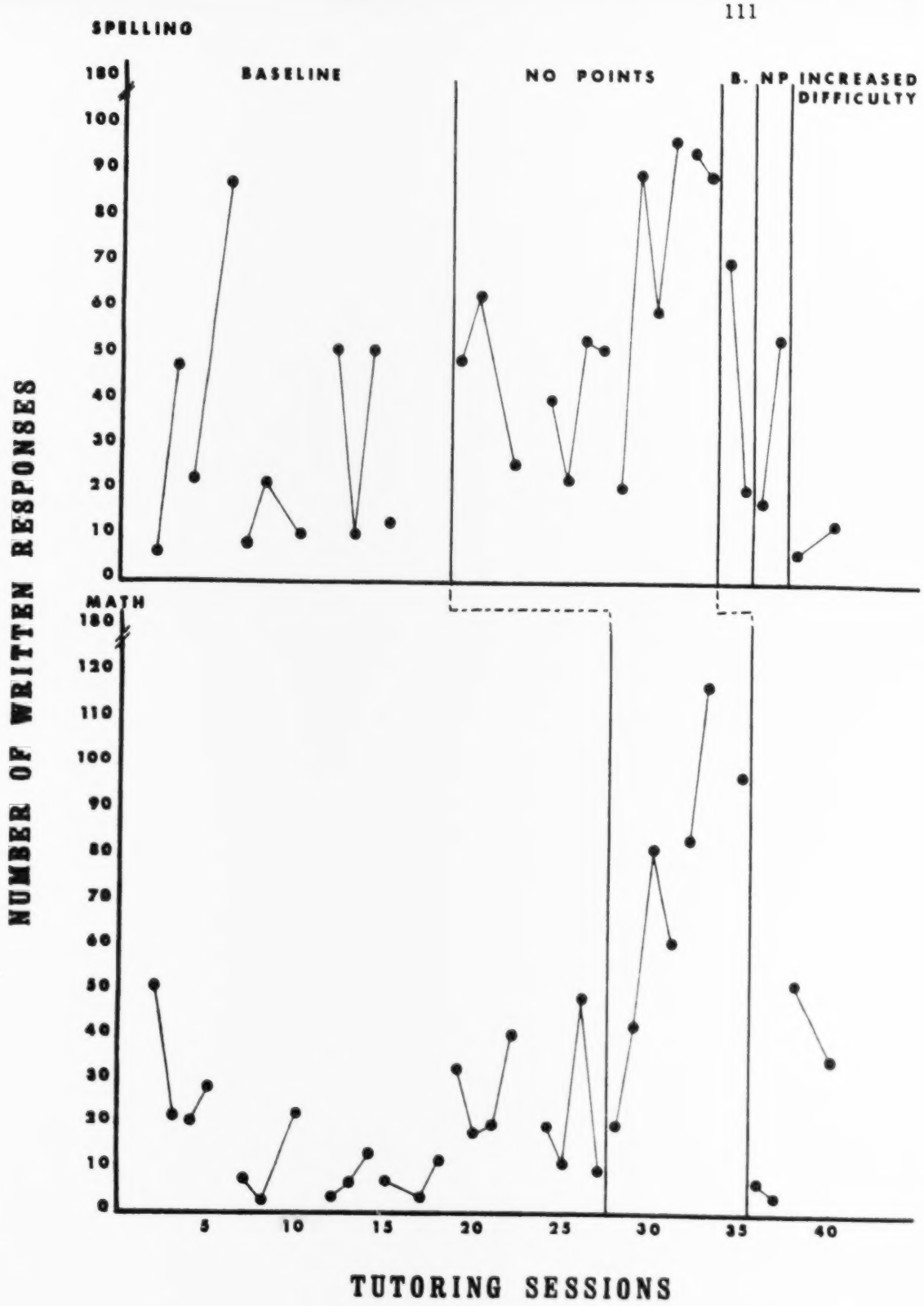

Figure 6 - Student 4: Weekly Spelling and Math Mean Scores

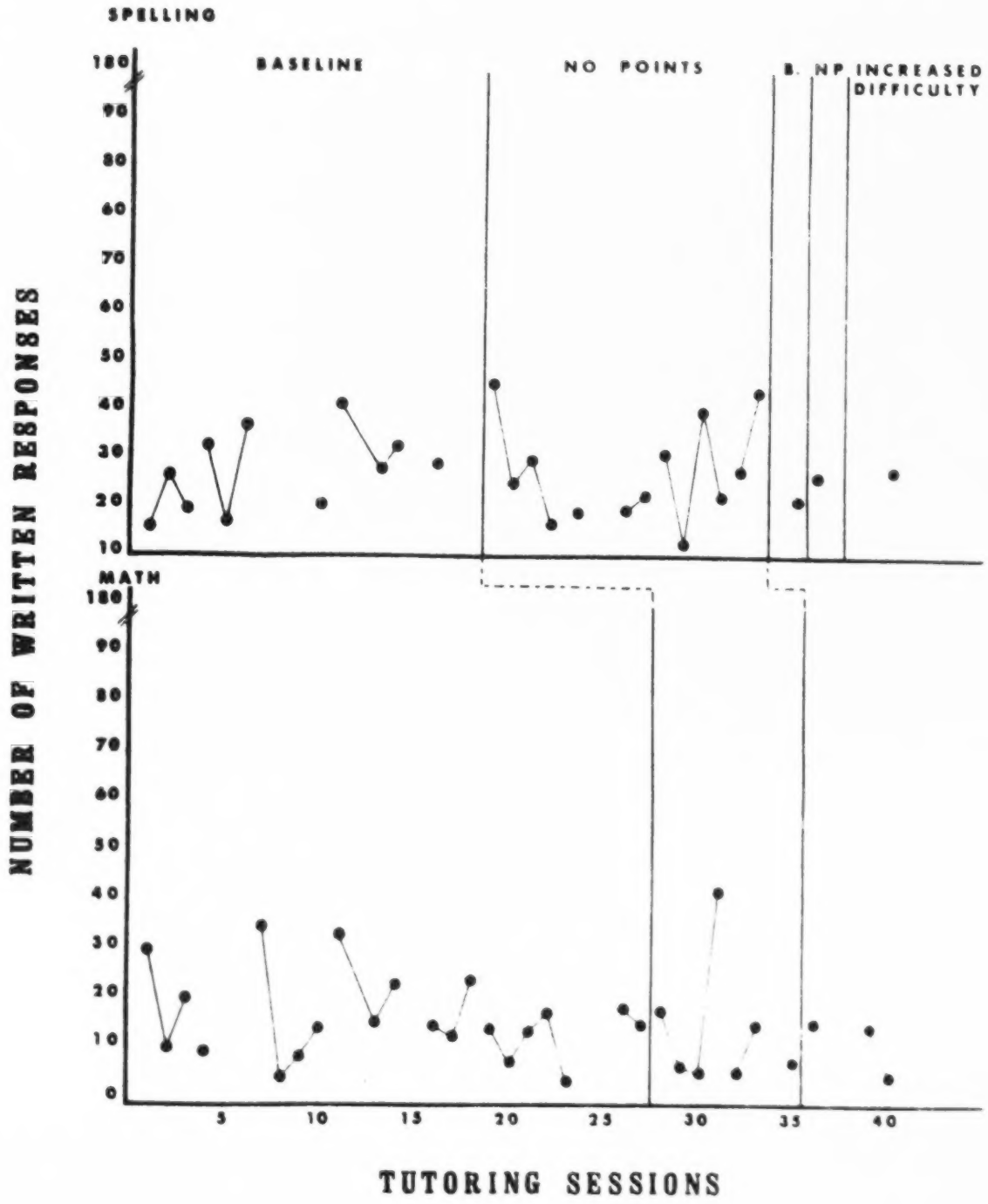

Figure 7 - Student 5: Weekly Spelling and Math Mean Scores

As for spelling, the withdrawal of points in math was followed by an increase in the number of math problems written by Student 1 during the first week of the no-points condition. This increase was not clearly maintained during the remaining three no-points sessions, which do not appear to differ substantially from sessions during the return to baseline. Table 1 shows that, overall, Student 1 wrote math problems at a higher rate during no-points than during baseline conditions.

Student 2, with the exception of one spelling datum, also wrote spelling words and math problems at relatively stable rates during the initial baseline. Her spelling rates increased during three of the five baseline weeks and her math rates increased during five of the seven baseline weeks. When points were withdrawn in spelling, Student 2 wrote words at only a slightly higher rate, overall, during the first week and then at a rate similar to that of baseline during the remaining three weeks of the no-points condition. When points were withdrawn in math, her rate increased and was maintained at a somewhat higher level than during baseline. Upon the reintroduction of points, Student 2's rate decreased to a rate approximating that of the original baseline. Table 1 shows that, overall, Student 2 wrote both spelling words and math problems at higher rates during the no-points condition than during the standard tutoring game. An examination of her test scores in Table 2 indicates that Student 2's average spelling scores and her one math score during the no-points condition were higher than her average spelling and math scores during baseline.

Student 3 wrote spelling words at the highest rate of anyone in the class during the initial baseline condition (Mean = 93.4), peaking at 256 words during the sixth session. Her rates were somewhat unstable during baseline, increasing during three of the five weeks. When points were removed in spelling, her rate increased substantially compared to the previous two weeks rising to 240 words at the end of the week. During the second week of the intervention her response rate decline. It then rose during the third week. As Figure 5 shows, she achieved her highest rate (263 words) at the beginning of the final week of the first baseline.

Student 3's initial math baseline rate appears more stable than that for spelling, but her rate increased during only three of the seven weeks. During the no-points condition in math, her overall rate rose somewhat, increasing during each of those two weeks, and then showed a slight decline when points were reintroduced. Table 1 shows that the average number of spelling words and math problems she wrote were higher during no-points than baseline conditions. One clue to her somewhat unusual responding pattern may be found in Table 2, which shows that she knew most of the spelling words and could answer most of the math problems at the beginning of each week. Her spelling and math scores do not appear to have differed appreciably from baseline to no-points conditions.

Table 1

Mean Number of Spelling Words and Math Problems Written Per Session During Standard Game (Baseline) and No-Points Conditions

	Spelling		Math		
Student	Baseline	No-Points	Baseline 1	No-Points	Baseline 2
1	64.2	90.2	37.5	60.1	42.4
2	64.9	80.8	35.1	63.5	26.8
3	93.4	117.5	37.8	50.1	40.5
4	30.4	58.2	19.5	72.1	24.5
5	17.5	18.3	16.1	15.0	10.0

Table 2

Mean Spelling and Math Achievement Test Scores During the First Game Baseline and First No-Points Condition

	Spelling				Math			
	Baseline		No-Points		Baseline		No-Points	
Student	Pre	Post	Pre	Post	Pre	Post	Pre	Post
1	50.0(6)	100.0(4)	50.0(2)	96.7(3)	63.2(6)	95.3(7)	---	100
2	22.3(6)	90.2(5)	29.0(2)	94.0(3)	30.7(6)	68.3(7)	---	93
3	90.3(6)	100.0(5)	100.0(2)	99.3(3)	80.0(6)	97.7(7)	---	100
4	20.7(6)	85.0(5)	21.0(2)	83.7(3)	76.0(6)	94.2(6)	---	93
5	20.8(6)	76.6(5)	37.5(2)	44.3(3)	11.2(6)	32.6(5)	---	71

Note: Numbers in parentheses are tests for which means were computed.

Students 4 and 5 wrote spelling works and math problems at relatively low rates during the initial baseline condition. Student 4's spelling rate increased during two of the first four weeks of baseline. His overall rate increased during the succeeding no-points condition although it increased within only two of those four weeks. His rate approximated original baseline rates during the subsequent no-points and baseline periods. His overall rate during the math baseline was low and relatively stable, increasing at least in math, Student 4's response rate showed a generally steady increase. It decreased substantially during the first week when points were reintroduced and then rose to a rate somewhat higher than his original base rate. Table 1 shows that Student 4 responded at higher rates overall during no-points conditions than during the standard tutoring game. His test scores remained about the same regardless of condition.

Student 5 responded at very low rates during both spelling and math sessions. Looking at Figure 7, it can be seen that the withdrawal of points in both subject areas had little effect on these rates. This is confirmed by comparing his overall rates in baseline and no-points conditions contained in Table 1. Table 2 shows that he averaged substantially lower spelling scores during the no-points as compared to baseline condition. His one math test during the no-points condition was higher than the average of those during baseline.

Discussion

The results of this investigation suggest that points and related components (winning teams, public posting of winning teams) can be removed from an established Juniper Gardens Classwide Peer Tutoring procedure with no resulting decrease in either student response rate or achievement level. The investigation bears discussion of the logic of the experimental design as related to the overall increase in response rate during the no-points intervention, of practical considerations for teachers using the peer tutoring procedure, and of implications for a more comprehensive investigation of the classroom dynamics of peer tutoring.

An examination of the group data in Figure 1 indicates that the overall increases in spelling and math response rates when points were withdrawn were not great and were due in large part to relatively higher rates during the first week of the no-points condition. During this first week, the mean number of spelling words and math problems written per session were 69.0 and 43.5 respectively, The individual data for Students 1, 3, and 3 are similar. Excepting the first week of intervention in each of the two baselines, spelling and math, overall increases in response rate were slight enough that one might argue there was no clear effect. However, the point system was assumed to maintain the response rate, and either the absence of any clear effect or an increase in the rate upon systematic withdrawal of the points would constitute a valid demonstration of the absence of the assumed functional relationship. The logic of this reasoning takes the form: If "A" (points maintain response rate), then "B" (removal of points will result in a decrease in the response rate);

not B; therefore, not A (Johnson & Pennypacker, 1980, p. 273).

A possible explanation for the overall increase in response rate upon point withdrawal is that, without having to wait for tutors to award points, tutees had greater opportunity to provide responses. There is evidence that this was carried to the extreme in a few cases (e.g., Student 3). Some students were observed to be writing responses before the tutor delivered the word or problem. It is important to point out, however, that the effectiveness of the tutoring procedures did not diminish during point withdrawal; achievement test scores did not increase.

The robustness of this peer tutoring model without points has obvious practical implications for classroom teachers. By not including points and related components, there is a saving of time (handing out and collecting point sheets, reporting point totals, summing and recording points, rewarding and recording the winning team) and materials (point sheets, team point and winning team charts). Unfortunately, the actual amount of time saved was not documented in this study. Although the procedure worked without points, it cannot be concluded that points have no utility. This study examined the effect of removing points <u>after</u> the standard tutoring procedures were well established. Points may play a more important role during the first weeks of implementation when such a reinforcement system may be useful in guiding students toward acquisition of correct tutoring behaviors. Further investigation varying the period during which points were withdrawn would provide the data necessary to address this issue.

Whether or not points initially controlled response rate during these peer tutoring sessions, by the time the points were withdrawn student responding was apparently being maintained by naturally occurring classroom contingencies. A logical "next step" would be to determine which natural classroom contingencies maintain high rates of academic responding in such a situation. Such variables as teacher and peer praise are like candidates. Informal observations in this investigation suggested that students were counting their responses, in some cases commenting that they beat their previous totals or those of their tutoring partners. An ecobehavioral analysis of the peer tutoring game, in which the objective might be to systematically manipulate the classroom variables suspected to interact with student responding during peer tutoring, could provide a comprehensive examination of the classroom dynamics associated with the Juniper Gardens Classwide Peer Tutoring game and would prove most informative.

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CHAPTER VIII

CONCLUDING REMARKS

CARMEN ARREAGA-MAYER, CHARLES R. GREENWOOD, AND JUDITH J. CARTA

The purpose of this monograph has been to serve as a forum for empirical research and papers developed by post-doctoral scholars concerning the developing trends within an ecobehavioral approach to special education, bilingual education, classroom management and instructional design. The papers and empirical research have pointed out that a quantitative approach to ecological factors is necessary to: (a) define program events that children actually receive in the course of their daily academic activities, and (b) relate these events in meaningful ways to outcome gains (e.g., academic achievement) that result over time.

The empirical research by Rotholz presented an ecobehavioral observation system for use in special education settings and evaluation research (CISSAR-SPED). He also examined the validity and reliability of the CISSAR-SPED on a pilot study with one autistic exceptional child. The paper by Terry reviewed the literature relating to disruptive classroom behaviors from an ecobehavioral perspective. She examined school ecobehavioral data that would explain lower academic achievement gains made by children with disruptive classroom behaviors and suggested an alternative for instructional effectiveness. The paper by Madrid evaluated the inappropriateness of developing methods in second language teaching and learning founded on current approaches (i.e., structuralism and transformationalism) and offered an ecobehavioral alternative to second language instruction. The paper by Chavez reviewed the literature relating to micro-ethnographic research and ecobehavioral research as it applies to bilingual, limited-English proficient populations. His paper provided a comparison of the two assessment approaches as quantified and direct assessment measures of education process. The paper by Benson provided an extensive review of the literature of the ecobehavioral variables affecting the educational achievement of severely and profoundly handicapped populations within community of institutional settings. The last paper by Nelson demonstrated empirically the validity of the Classwide Peer Tutoring program as a technique for improving the academic achievement gains of minority special education children. The Classwide Peer Tutoring is an instructional methodology that increases the opportunity to actively participate in the academic task at hand for all students in a classroom. This technique takes advantage of the ecobehavioral variables available to the teacher to increase achievement gains.

In contrast to traditional assessment approaches, it has been demonstrated that ecobehavioral interaction enables one to (a) display the structure and pattern of momentary ecology variables, such as academic achievement, disruptive classroom behavior, or bilingual instruction; and (b) behavioral relationships to this ecological structure. Ecobehavioral assessment is dynamic, focusing upon changing situational factors and subject responses (Greenwood,

1985). Thus, an ecobehavioral interaction approach may prove to be an instructional development in behavioral, bilingual and special education research. As the chapters in this volume have suggested, the ecobehavioral approach is increasingly evident in the literature, however, it is just beginning to have an impact on work in applied settings. The relative newness of this approach is mainly due to the methodological and conceptual issues reviewed in this volume, in addition to practical issues.